The Citrus Industry
THE ONLY PUBLICATION IN THE WORLD DEVOTED EXCLUSIVELY TO CITRUS FRUITS
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Representative of every interest—
Representing no special interest.

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Florida Citrus Faces Advertising Competition Never Before Experienced

By C. C. Commander, General Manager, Florida Citrus Exchange

Every citrus grower in the state should study the advertisement of the California Fruit Growers Exchange on the back cover of the Saturday Evening Post for February 20. It brings up a matter which is vital to Florida's greatest industry.

The advertisement is a fanciful picturization of California's groves, situated at the base of mountains. The main idea behind the copy is an attempt to prove that, because California's groves are watered by the "melting snows" and have warm days and cool nights fostering their growth in peculiarly rich valley soil, a greater deliciousness of flavor and an extra quantity of vitamines are injected into the juice of oranges from that state.

Most particularly evident is the headline—"California Juice is Richest in Soluable Solids that Make Orange Juice Healthful and Delicious".

C. C. Commander

Untruthful Advertising

That the statements made in that copy are false was carefully proven by the Florida Citrus Exchange during the spring of 1925. Steps to forestall this comeback of California in answer to our effective "1-4 More Juice in Florida Fruit" copy were taken by our advertising department at that time.

Complete chemical analyses of California and Florida orange juices were made. Without going into the mass of detail available from the report of these New York Laboratories, suffice it to say that the mineral content, organic salts, etc. of the Florida orange is more than double that of the California product. The Florida juice contains more than two and one-half times as much lime as California's.

The Florida orange is sweeter than that of California. In each case, the chemical form of the sugar is nearly alike, but the California product has somewhat more than twice as much citric acid per unit of sugar in each unit of juice volume than the Florida orange. A third finding of these labortories showed average figures for juice which gave the Florida orange 33 per cent more juice than California's. We claim 25 per cent more in our advertising.

Florida Advertising Should Answer

The vast majority of American consumers will realize none of these facts unless we bring them forcibly to their attention. They are just as ready to believe California's false propaganda as any. And as they believe, so are their fruit-buying preferences guided. They are just the more certain to believe that advertised untruly because it is presented in the volume that cannot be afforded by the Florida Citrus Exchange, with an advertising revenue on but 35 per cent of Florida's fruit.

The facts are all in Florida's favor. The Exchange, in its present campaign has done everything possible with its appropriation to present these facts to American consumers—facts which will react to the benefit of all Florida growers. But the work of the Exchange alone is not enough.

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Spraying for Citrus Melanose Control

By H. R. Fulton, Pathologist, U. S. Bureau of Plant Industry

Success in controlling a fungus disease by spraying always depends on three things, using the right material, in the right way, at the right time.

For melanose of citrus fruits 3-3-50 Bordeaux mixture with one per cent oil as emulsion added is undoubtedly the best available material. Many ready made preparations are available and give satisfactory results if used at a strength equivalent to that indicated above. While the oil in the mixture tends to keep down insect pests, it cannot be depended upon to check entirely scale increase. There must follow an oil spray especially for scale control the first week in July.

Thoroughness of application largely determines the percentage of control. The object is to cover practically every young fruit with the protective coating. This calls for high pressure, good nozzles, careful workmen, and close supervision.

The right time to spray is just before the expected onset of heavy infections, which usually start in May and may extend to early June. These outbreaks depend on three factors: (1) susceptibility of the fruit, (2) supply of melanose fungus, spores, (3) favorable weather conditions for development of the melanose fungus.

The young fruit is susceptible until it reaches a diameter of about 1 1-2 inches for oranges and 2 1-2 inches for grapefruit. This is from blooming time until early in June under normal conditions.

Fruit infection with melanose is caused by spores that are produced by the melanose fungus in large numbers in the bark of dead twigs. These spores are not found in maximum numbers until after two or three spring rainy periods have favored their development. It is usually the last of April or early in May before they can be seen oozing in cream-colored sticky tendrils from a considerable proportion of the minute pustules in which they are formed.

In order for the ripe fungus spores to produce melanose spots on the fruit, they must be carried to the fruit and must germinate there. Wet weather is necessary for both things. Heavy dews and sudden showers are not nearly so favorable as are cloudy rainy periods of two or three days. Severe outbreaks of melanose can be definitely traced to such storm periods occurring as a rule in May or early June, after melanose spores have had a chance to develop in quantity and before the young fruit has developed beyond the stage of susceptibility. It is only in exceptional years, perhaps once in 5 to 10 in the average, that the combination of conditions is right for maximum infection to occur as early as April; nevertheless there are always some spores ripe then, and enough moisture to lead to scattering light infactions.

In the normal season, one application 3-3-50 Bordeaux mixture plus one per cent of oil as emulsion can be depended upon to give satisfactory control of melanose if properly made the latter part of April or before May 5. In support of this the writer presents the results of several seasons' experimental tests made at the U. S. Citrus Diesease Laboratory at Orlando, Fla., by J. R. Winston, J. J. Bowman and W. J. Bach, as well as the showing from spraying done in various parts of Florida by growers each doing the work in his own way.

Figure 1 shows in diagrammatic form the relative effectiveness during three seasons of single applications of Bordeaux-oil emulsion made at ten day intervals over a period of about two months, beginning about April 1. The spraying was done in an old seedling grove where conditions were very favorable for melanose. It will be seen that effective control was secured in 1922 from April 10 to May 20, in 1923 from April 25 to June 6, and in 1924 from April 7 to June 6. Similar tests in 1925, not included in the chart, gave effective control from April 13 to May 14. It further appears that on the average nothing was gained by spraying before April 15, and that in some years there was an advantage in waiting until about April 25 to make the application for melanose, the delay favoring the effective persistence of the spray coating during the whole of the five or six weeks danger period. For the four years in

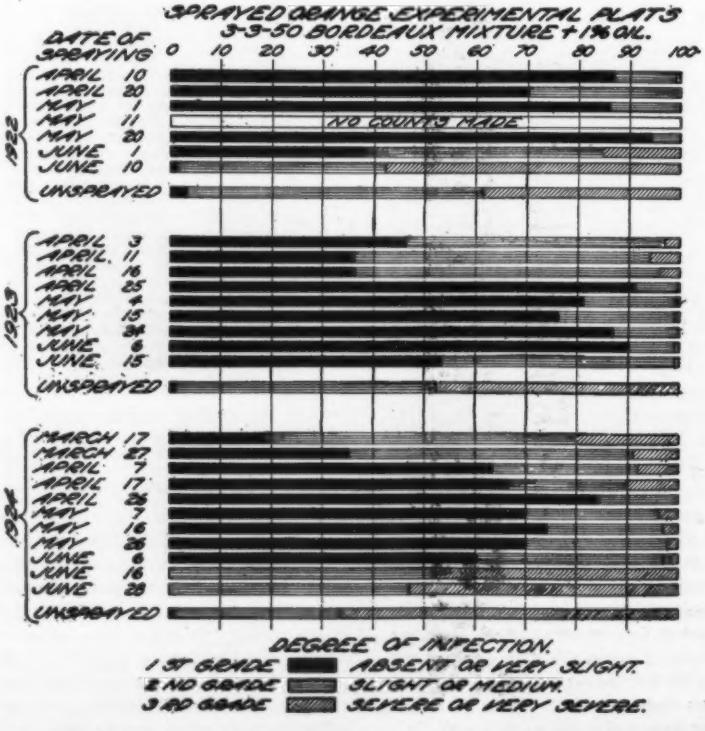

Fig. 1. Experimental orange plats, each sprayed once on date indicated with Bordeaux-oil emulsion for melanose control.

question under the conditions prevailing in this test, there would have been no serious loss in effectiveness from delaying the application until May 15. But the greater the delay, the greater the danger of being caught unprotected, and it is certainly wisest to get the work done promptly in the first part of what seems to be the best period, which would mean between April 25 and May 5.

In figure 2 are indicated the sort of results that may be expected when various growers in various localities undertake to control melanose by spraying. The showing is for one season, but is typical of the grove counts made during four seasons. The majority succeeded. This seemingly was not due to using the wrong material, or to applying it at the wrong time. It was most likely due to lack of thoroughness in spraying.

A summary has been made in Table 1 of the results of 152 orange and grapefruit grove spraying operations during three seasons, 1922-4. Bordeaux-oil emulsion was used, and a single application made. A production of 81 to 100 per cent first grade fruit has been considered excellent control, and of 61 to 80 per cent good control. The percentage figures indicate the proportion of groves out of all sprayed during an indicated period, that showed either good or excellent control.

An equal proportion secured excellent control for the ten day periods before and after May 1.

From the somewhat limited data presented it would seem that chances for first class control were very much lessened by spraying before April 21 and by waiting until after May 10.

It must be recognized that calendar dates applicable during one season or in one locality may not hold strictly in another, and more than three seasons' results are desirable. But in so far as they go, these practical results under a considerable range of conditions give support to the general recommendation to begin spraying in the average season close to April 25, and have the work finished by May 5. If a longer time is required to get over a large property, it is better to start a few days before April 25 than to take chances in having the job last very much beyond May 5.

Remember to count on making an application of oil emulsion the first week in July to check the increase in scale insects that naturally follows an effective spraying for melanose.

Profits from spraying for melanose depend on (1) cost of spraying per box (including the cost of the July clean up spray for scale, if not otherwise required), (2) the degree of melanose control as measured by the number of boxes of fruit advanced one or two grades, and those saved from the cull pile, (3) differences in market returns for the several grades of fruit. All of these factors vary very much with conditions. Usually the grower can figure, at the end of the season, the first and third of these profit factors, but has no real basis for a close estimate of the second. To determine accurately what profits result from spraying, a few representative trees should be left unsprayed, and the grading of the fruit from these compared with the sprayed trees. On such a basis it is not unusual to show a net profit of 25 cents per box for the entire crop.

There are two important secondary benefits from Bordeaux-oil spraying for melanose control. One is the improvement in the keeping quality of the fruit during marketing due to the partial reduction in liability to stem end rot. This reduction may be as high as 50 per cent from the one application that secures satisfactory results for melanose. The second is a reduction in the tendency of the fruit to develop ammoniation blemish, resulting in some instances in complete elimination of this trouble.

In so far as indications go, pruning out dead twigs that harbor the melanose fungus cannot be depended upon to control melanose. Getting rid of excessive dead wood is good grove practice and reduces sources of melanose infection. But it is practically impossible, except at prohibitive expense to remove small twigs with sufficient thoroughness to really secure control by this means alone. It is important to avoid too rapid accumulation of dead wood in young bearing groves.

It is poor business to spend money preventing melanose, and then leave the fruit unprotected from rust mites or allow the trees to be attacked by scales. Melanose spraying is right-

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TABLE 1.—Effectiveness of Spraying for Melanose in 128 Grove Operations, 1922-4.

Time of spraying	Number of groves	Percentage of groves securing good control (61-80 per cent first grade fruit)	Percentage of groves securing excellent control (81-100 per cent first grade fruit)
Before April 21	13	46 per cent	23 per cent
April 21 to 30	52	29 per cent	48 per cent
May 1 to 10	50	18 per cent	48 per cent
After May 10	13	30 per cent	15 per cent

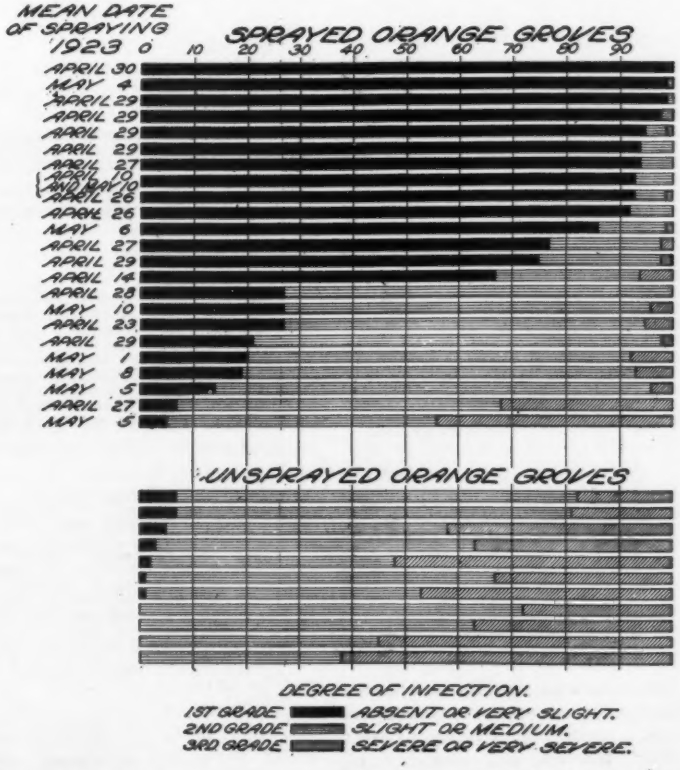

Fig. 2. Commercial orange grove sprayed by owners with Bordeaux-oil emulsion for melanose control.

Grapefruit – Storage

Cold Storage of Florida Grapefruit

By Lon A. Hawkins, Physiologist, and William R. Barger, Assistant Physiologist, Office of Horticultural Investigations, Bureau of Plant Industry

The steadily increasing production of grapefruit in Florida, which rose from 3,200,000 boxes in 1912-19 to 8,000,000 boxes in 1923-24, tends to furnish the market with more of this fruit than can readily be absorbed during its regular season. Occasional periods of over-supply, in which the fruit does not sell for enough to pay the cost of marketing, have occurred all too frequently in the last few years.

In an attempt to lengthen the season for the distribution and consumption of grapefruit, investigations on the storage of this fruit were begun in 1917. In the experimental work it was found that cold storage improved the flavor of the fruit, that the bitter principle was broken down and the acid content decreased, while the sugar content remained about the same. Fruit in cold storage, however, had a tendency to pit; that is, to become covered with sunken brown spots after being held six weeks to two months, and it was necessary to work out some method to prevent this pitting in order to make cold storage commercially practicable. The method found to control this pitting was to cure the fruit by exposing it to a temperature of 65° to 80° F. with a relative humidity from 55 to 65 per cent for one to two weeks. Grapefruit cured in this way has been held three to six months without developing sufficient pitting to injure its commercial value.

Heretofore the experiments have been confined to quantities of grapefruit contained in not more than 10 or 15 boxes. It remained therefore, to test the process in a commercial way with carload lots, storing the fruit and selling it on the market. This work was begun in the spring of 1922, and the present bulletin gives the results obtained from the curing and storing of about three carloads of grapefruit. A method of treating the fruit to control decay in storage is also discussed in connection with other experimental work.

Experimental Work

The grapefruit used in all this experimental work was of different varieties, including Duncan, Silver Cluster, Walters, and seedlings, all of which contained seeds. The Marsh seedless variety was not used, because in previous work it was found that it had a tendency to develop an unattractive flavor if stored for a considerable period.

First Experiment

In the first experiment 343 field crates of grapefruit picked March 27 and 28, 1922, were used. During the curing process, which lasted 13 days, the boxes were stacked four high in rows 1 foot apart on the packing-house floor, the temperature of the house varying from 67° to 85° F., with a rather wide range of humidity, 38 to 98 per cent. The mean temperature was about 75° F. and the average humidity about 65 per cent. The shrinkage of the fruit in this time, determined by the weight of samples at the beginning and end of the curing period, was found to be 3.9 per cent. Sixty boxes were inspected for decay when the fruit was packed. It was found that the average decay due to blue mold was 1.8 per cent and to stem-end rot 1.1 per cent, a total of 2.9 per cent during the 13 days. The 343 standard field crates packed out 231 boxes of merchantable fruit. This fruit was precooled, loaded in a refrigerator car, shipped under initial icing to the experimental cold-storage plant at the Arlington Experiment Farm, Va., and placed in 32° F. storage immediately on arrival April 17, about 20 days after harvesting.

The first lot of 100 boxes was sold June 2 to 6, after having been held 46 to 50 days. There was practically no pitting of the fruit. There was, however, 9.6 per cent decay in the first-grade fruit, 5 per cent in the second, and 13.7 in the third, necessitating sorting out the decayed fruit and repacking. A second lot was sold June 17, two months after the fruit was placed in storage, and, as in the first lot, there was practically no pitting. There was, however, 14 per cent decay in the first grade, 5.5 per cent in the second, and 14 per cent in the third. Small lots of second-grade fruit were sold on June 23 to 26, and there was an average of 9.9 per cent decay, with no appreciable pitting. The last lot of fruit, sold August 6 and 7, about three and two-thirds months from the time the fruit was placed in storage, or a little over four months from the time the fruit was harvested showed considerable pitting. There was an average of 37.5 per cent decay in the first-grade fruit, 36 per cent in the second, and 44 per cent in the third. Although this fruit was edible and in good condition when removed from storage, it broke down very quickly at the ordinary market temperatures; hence there was much waste. A few fruits held until September were in good condition for use immediately after removal from storage but would not stand up long at ordinary market temperatures. The prices received for the fruit were fairly high, being about $6.50 per box as compared with $3 to $3.50 when the fruit was placed in storage.

From this experiment it is evident that grapefruit packed at the beginning of April can be held for two months and be in fair condition when removed from storage, but it is necessary to sort it and remove the decayed fruit in order to obtain a good merchantable package. The increase in price after two months' storage in this case much more than paid the cost of storage and conditioning. Holding the fruit longer than two months, however, was hardly practicable, in view of the fact that there was considerable increase in decay over the longer period and the fruit broke down quickly when placed on the market. Cold storage, of course only slows down the life processes, and fruit which is ripe or overripe on the trees can not be maintained indefinitely in good condition in storage.

Second Experiment

The second car of grapefruit for these storage experiments was packed January 15, 1923, and arrived in Washington January 25. This fruit was divided into five lots. Some of it was allowed to cure by standing in the packing house, whereas that in other lots was exposed to the fumes of the incomplete combustion of kerosene in a coloring room. The lots were as follows:

Lot 1. Picked January 8; treated with kerosene-stove gas 24 hours; then cured in packing-house air one week; shrinkage in weight before

packing, 1.5 per cent.

Lot 2. Picked January 8; cured seven days in packing-house air; shrinkage in weight before packing, 1.5 per cent.

Lot 3. Picked January 10; treated with kerosene-stove gas 63 hours; shrinkage in weight before packing, 2.5 per cent.

Lot 4. Picked January 12; treated with kerosene-stove gas 48 hours; shrinkage in weight before packing, 2.5 per cent.

Lot 5. Control. Picked January 15 and packed the same day without curing.

The fruit was shipped in a refrigerator car under standard ventilation, arrived in good condition at the Arlington Experiment Farm January 23, and was unloaded January 24. No decay was found in any of the boxes inspected at the time the fruit was placed in storage. The temperature was 32° F., as in the first experiment. Five weeks after the fruit was placed in storage, when 200 boxes were sold, there was practically no decay in the first-grade fruit, 0.92 per cent in the second, and 0.47 per cent in the third. The fruit cured by treating with kerosene-stove gas showed the least pitting, about 4 per cent of which was noticeable from the standpoint of marketability; that is, the pits were more than one-eighth of an inch in diameter and fairly numerous. There was about 6 per cent pitting of this type in lot 2, which was cured in the packing house and was not treated with gas. On March 14, a little over seven weeks after the fruit was placed in storage and about nine weeks after the first lots were picked, the remainder was sold. There was less than 1 per cent decay in any of the lots. There was, however, some pitting.

Lot 1. Treated with kerosene-stove gas for 24 hours; had about 8 per cent pitting which could be considered noticeable from a commercial standpoint.

Lot 2. About 3 per cent rot in this lot, which was cured seven days at packing-house temperatures and showed some pitting.

Lot 3. Cured with kerosene-stove gas for 63 hours; showed 2.2 per cent pitting.

Lot 4. Cured 48 hours in kerosene-stove gas; showed 4 per cent pitting.

Lot 5. Picked and packed directly without curing; showed 5 per cent pitting.

This experiment indicates that about as good results can be obtained by curing by means of gas from the incomplete combustion of kerosene in an ordinary cooking stove as by allowing the fruit to stand at packing-house atmosphere from a week to 10 days and that fruit picked the early part of the season can be readily stored for six weeks to two months at 32° F. provided it is in good condition when placed in storage.

Third Experiment

A third car of grapefruit was stored in April, 1923. This fruit was picked April 10, immediately after which it was stacked in the packing house with air spaces between the stacks to provide good ventilation. During the day the fruit was exposed to the packing-house air, and at night when the humidity was high a large tent was placed over it, with a two-burner kerosene stove under the tent. The fruit was cured four days, during which time the humidity ranged from 47 to 73 per cent and the temperature from 79° to 84° F. The loss in weight was 1.6 per cent. The fruit was packed April 14, loaded and shipped under standard ventilation April 16, and arrived at the cold-storage plant at Arlington Experiment Farm, Va., April 23. An inspection on arrival showed 4 to 5 per cent decay. The fruit was unloaded immediately and placed in storage at a temperature of 32° F.

Examination after the fruit had been in storage six weeks showed 1.14 per cent decay due to stem-end rot and 3.2 per cent due to blue mold, making a total of 4.3 per cent in the first grade. The second grade showed 0.68 per cent stem-end rot and 3.3 per cent blue mold, totaling 3.98 per cent. In the third grade there was 0.85 per cent decay due to stem-end rot and 7.3 per cent due to blue mold, a total of 8.15 per cent. Another inspection one week later showed 3.39 per cent total decay in the first grade, 2.98 per cent in the second, and 14.3 per cent in the third. In the inspection after seven weeks' storage the first and second grades showed 4.4 per cent bad pitting; that is, pitting in which the sunken areas were more than one-eighth of an inch in diameter. The third grade showed 10.5 per cent of this type of pitting. Uncured fruit of the first grade showed 4.8 per cent bad pitting at this inspection. In seven weeks' storage, or about nine weeks from the tree, there was about the same amount of bad pitting in the uncured control as in the cured fruit, which is in accordance with the results obtained in the two other experiments, namely, that in a storage period of a month to six weeks at 32° F. the development of pitting even in uncured fruit is not liable to be of any appreciable significance in a commercial way.

It had been observed in earlier experiments that fruit which had been exposed to kerosene-stove gas for a sufficient length of time to loosen the stem buttons so that they were removed in passing through the washer and polisher was less liable to decay than fruit which retained the buttons. This seemed to offer a method for controlling this disease in storage. It was tested experimentally with comparable fruit, from certain lots of which the buttons had been removed by treatment with stove gas, whereas others treated with gas for the same length of time still retained the buttons. The results of these experiments are shown in Table 1. Some of the fruit included in this table was held at a temperature of 70° F. throughout the experiment, while part of it was placed in cold storage at 32° for 30 days and then removed to a 70° temperature for varying lengths of time.

It is evident from Table 1 that there is considerably less decay in the fruit from which the buttons have been removed. This was particularly true where the fruit had been in cold storage for one month. From this work and from other experiments along the same lines it seems probable that the removal of the buttons from the fruit by a treatment with stove gas would be of considerable benefit in the storage of grapefruit. Winston, Fulton, and Bowman discuss this method of the control of stem-end rot in a recent publication.

In the course of this storage work examinations were made of a number of cars of fruit in various commercial storage plants, most of which was stored without curing. In two cars which had been stored three weeks and one month, respectively, there was no pitting. In an inspection of fruit from a third car stored eight weeks 48 per cent pitting was found in the second-grade fruit and 28 per cent in that of the first grade, while practically the same conditions were found in a fourth car that had been in storage for a little less than eight weeks.

General Discussion

The results of these experiments, together with data presented in previous publications, indicate that the cold storage of grapefruit is practicable from a commercial standpoint. It is evident that storage in the latter part of the season may result in sufficient decay to make it necessary to sort and repack the fruit, thus increasing the cost of storing, and this, together with the storage charges, will undoubtedly warrant a

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Citrus Fruits - Prices

Why the Consumer Pays So Much and the Grower Gets So Little

Radio Lecture by A. M. Pratt, of Chase & Company

During the War, the public was so aroused over the discrepancies between consumer and producer prices, that our Government made the first comprehensive investigation of the kind on perishable food products. The public were expecting some rather startling disclosures of profiteering, but the findings from this standpoint were disappointing as they showed the jobber, or wholesaler of fruits, was working on about 10 per cent gross margin; and after deducting the wholesalers expenses, he averaged only 3 1-3 per cent net profit.

Retailing, was the next big problem investigated, and the retailer was found to be working on a margin two and a half times as great as the wholesaler, or to be exact, 26 per cent. Yet Bradstreet and others showed retailer expenses were so heavy as to force over 25 per cent retailers out of business every year. The Government's investigation indicated a net profit of only 1.5 per cent for the retailer, or less than half of the net profit of the wholesaler. Yet the retailers proportion of the consumers dollar is greater than any other item in fruits and perishables. Doubtless there are too many retailers who do not understand sound merchandizing. Also no doubt, you, as the consumer, have unknowingly contributed to the retailers difficulties in many ways.

"But, what's the sense", you will say, "of paying 15 to 30c for a half grapefruit in a restaurant or hotel when the grower gets only two or three cents a piece for a whole grapefruit. How many grapefruit are there like this in a box? Fifty four? That makes at least a hundred halves doesn't it? Well, that's $15 to $30 a box for grapefruit. That's nonsense!"

"And oranges are about as bad. Why, I paid 10c for an orange of this size here just the other day, and how many are there in a box? Hundred and twenty six? Just look at that! $12.60 for a box of oranges and you say your grower gets less than $2.50. Then I pay ten times as much as you say you pay your growers, and then some. Who gets all the money! That's what I'd like to know!"

Haven't you said things like that? Sure you have—so have I. I grow oranges and would like to have more of the money and I also pay big prices in the best hotels for grapefruit and oranges. And we like to let loose in thinking how unjust the world is to us to have things this way. It makes us indignantly pious. We can get a great kick out of our righteous indignation—in fact we get eloquent and all told quite satisfied and "het up" with our virtues, in comparison with the grasping greed of others.

But really what is our problem? How much of this discrepancy is necessary and what explanations are there? In the first place we like to use an extreme example, don't we? You can buy oranges for a good deal less than ten cents a piece and grapefruit for less than 30c a piece.

When you buy your grapefruit in that delightful hotel where the elect go, you are buying lots more than grapefruit, you are paying part of the wages of the waiter; the chef—who didn't cook the grapefruit but who prepared it so prettily in the glass dish filled with ice; the dishwasher, the musicians who play while you eat and dance; the head waiter who asks if everything is alright and to whom you most graciously assure in return that it is, and feel fine for his attention. And—well if you will go to a modest Italian or Greek fruit stand you can buy the same and even larger grapefruit for 15c or 2 for a quarter. So if you will do some figuring you will see you have paid at the rate of $7.50 a box just to have all these other frills and conveniences to save yourself the bother of buying and preparing the grapefruit yourself, and to satisfy your pride in being in the "best" hotel in town.

Convenience and pride explain half the cost right at the start. The other day I read in the Nation's Business about a candy manufacturer who had perfected his business, where he could put out his candies of exceptional merit in a unique attractive package for 80c a pound and make a fine profit if he developed proper volume. He struggled along for sometime—advertised and yet the business did not come his way. It was not until a friend told him that his trouble was because his pride did not appeal to the best customers, that he found his difficulty. He opened up a new line of appeal by advertising a candy that was exclusive, and announced the appealing price of $1.80 per pound and his business pyramided.

Pride and unintelligent buying? Yes, pride; but has it ever occurred to you the pleasure you get in merely the spending of your money, rather than eating or using the article bought—the satisfaction in feeling you paid the top price? If you want to do that, maybe we shouldn't call that unintelligent buying, but rather buying intelligently from the standpoint of satisfying that impulse of getting the most expensive thing of the kind you could get. We like to do things with a flourish—we like atmosphere. We have our teeth filled by the dentist who charges the most because he is accepted by the social set we wish to be in. We select our Doctor, our Preacher—well, anyway some of us do—for the same reasons. Asked by the Hotel proprietor—"with or without bath", we say, "with bath" —though we know it is late and we want to sleep late and will not take the bath in the morning.

Convenience, the crowded time of all of us, pride and a readiness to pay the top price in the belief that your chances are greatest of getting the best, have much to do with the gulf between consumer and producer prices. You, as a consumer, are not helping the producer nor the industry generally in this lack of thrift in buying. The modest fruit stand or store that is eager to build business by close prices in fruits and a rapid turnover is not encouraged. The keener the buying sense of the consumer, the better in the end the problem will adjust itself for all.

During the first half of February of this year a questionnaire was sent to get a line on retail prices. Reliable reports from 25 cities came back

showing the average prices that stores were charging the consumer. On Florida grapefruit the average of those reports show consumer prices of 13 1-2c a piece for 36s—12c for 46s—10 3-4c for 54s—9 1-3c for 64s—and 8 3-4c for 70s and 80s. These reports came from chain stores and other stores catering to fruit buyers and indicate surprisingly reasonable prices to the consumer. Doubtless some stores can be found where prices are excessive but these were the everyday going prices reported from a disinterested standpoint, and from widely scattered and representative cities.

Putting these retail prices into terms of boxes and subtracting the average prices realized for Florida growers on shipments that would be reaching the consumer the first half of February, we find after deducting freight, packing and marketing, picking and hauling that there is left a difference of $1.70 per box on 36s, $1.48 on 46s, $1.92 on 54s, $1.78 on 64s and $1.98 on 70s, or an average of $1.77 to cover gross profits of retailers and jobbers.

The wholesalers gross margin will usually average about 60c per box, leaving in this case but $1.17 for the retailer. Maybe the wholesaler was forced to work on a closer margin, as the retail margin in Citrus is usualy closer to $1.70 a box. With both the wholesaler and retailer, we must bear in mind they assume loss by decay as well as all other expenses in selling, including the heavy expenses a retailer is under in selling to you as a consumer, only a few grapefruit at a time.

The response on oranges showed a much wider margin. One hundred and fifties averaged to the consumer 4-3-4c a piece, 176s 4c, 200s 3.6c, 216s 3c, and 250s 2 1-2c, or an average on all sizes of $6.96 per box. Oranges shipped in time to reach these consumers, averaged $3.08 per box f.o.b.

It costs 11c more for icing oranges on an average than grapefruit, most grapefruit being shipped without refrigeration. Therefore deducting this and a dollar freight, we are left with a gross margin of $2.77 per box to cover wholesalers and retailers expense and profits, or a dollar more margin than our grapefruit. As oranges develop more decay than grapefruit, it might be fair to penalize oranges 50c before making the comparison. This leaves $2.27 from which to deduct the wholesalers margin say of 60c, leaving $1.67 margin for other expenses and profits to the retailer, or 50c per box more than on grapefruit. Doubtless the popularity of the orange compared with grapefruit partly explains the apparent wider margin on oranges. This test would indicate the lowest practical margin possible on grapefruit and possibly a wider margin than necessary on oranges.

Carefully compiled figures in a comprehensive form have not been gathered on the costs of production in Florida but it would seem from a popular standpoint that we could figure it costs the grower about $1.00 per box for growing his oranges and grapefruit. The other expenses through to the consumer could be roughly itemized as 20c for picking and hauling, 90c for packing and marketing, $1.00 to the railroads, 60c to the wholesaler, and $1.70 to the retailer, or a total of $5.40.

Therefore if the grower is to receive any net profits, the consumer must pay at a rate that will be over $5.40 per box. For an easy figure to remember and to make it conservative, let's call it $5.00 per box as standing between you as a consumer and the grower as a producer, before the grower begins to get a profit from his investment and work.

Doesn't this $5.00 explain pretty well why the consumer pays so much and the grower gets so little? A keener, more thrifty attitude in finding and buying from the store or stand that gives you the best fruits for the least money would go a long way towards reducing the gap between grower and consumer. The remedy lies with the consumer. The retailer who works on a wide margin is going to continue working on that margin if he finds that the consumers do not increase their purchases on a lower margin. Buying by the box, if it became customary, would more radically reduce the discrepancy and is no longer impractical with automobiles averaging one auto to every six persons. The cost of selling oranges or grapefruit by the piece is tremendous in the time and service required. The costs of delivering to your house, and of bad debts and bookkeeping in charge accounts is another big item of the retailer.

Buying by the box—the throwing it into your car and paying cash for it, if customary, would reduce the gap, a dollar per box; and is the only big remedy that would be possible. Other economies in the industry are possible but insignificant compared with this, and every family would have better health and enjoy life more if it were customary to have a box of oranges and grapefruit in the cellar, pantry or kitchen.

The California Fruit Growers Exchange have systematically compiled data on this general grower to consumer problem from 1918 up to the present time, and find for every dollar the consumer pays for oranges about 25 per cent goes to the retailer, about 8 per cent to the jobber, 18 per cent to the railroads, and 10 per cent to harvesting, packing and selling, leaving 39 per cent to the grower from which the grower must pay his cost of production before he earns money. To put it more easily the railroads, the wholesalers and the retailers get about half the money and the packing organizations and their growers the other half. In a big crop year, the grower will get less and the balance will get more; and vice versa.

From the facts presented to-night, it seems that the laws of competition will work out pretty well the survival of the fittest. The grower seeks the channel where he expects to realize the most money from the packer and is watching with an eagle eye all expenses. The packer seeks those jobbers to whom he expects to sell for the most money. The jobber is equally exacting with his customer. The benefit of competition however is directly lacking between railroads. It is controlled somewhat by Interstate Commerce, by the agitation on the part of shippers for the railroads showing their needs for greater income or reduced wages to their employees.

The consumer is the other weak link in the chain of competition, as the consumers are expecting more and more service and convenience in their buying, and are not generally economic in their searching out and buying through those sources where greatest value, (at least in the article), is obtainable for the least money. In fact as illustrated at the beginning of this talk, with times as prosperous as they are, the consumer likes to be a free-spender, many spend with a flourish and superficially buy the highest priced article in the belief the highest priced is always best. It is too bad to blame you consumers this way but many of you will smile and admit to yourself it is true, and take a certain pride in it being true, and more than that it's your money you are spending, so why worry.

Therefore I will close this discussion. To give you an insight into this problem, some statistics were necessary and I know statistics are dry stuff. A boy asked his Dad, who didn't want to be interrupted, what a Statistician was. He answered, "A statistician! A Statistician! Well, there are liars, damn liars and statisticians".

Good-night.

The Citrus Industry

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GROVE CALENDAR FOR MARCH

Timely Suggestions for Grove Work During the Present Month

Keep the Acme harrow going every week or ten days in the citrus grove; frequent cultivation checks loss of moisture required by young fruit.

Trim nursery stock preparatory to budding; start budding if stock is ready.

Spray to control melanose and scab of citrus with 3-3-50 bordeaux-oil emulsion (1 per cent oil); apply spray ten days after petals fall.

Pick up and destroy wormy peach drops and lesson later damage from curiulio (wormy peaches).

Spray or dust pecans with lead arsenate, as the leaves come out, for case borers and bud worms.

THE MARKETING PROBLEM

The Citrus Industry this month carries several articles bearing upon the proper system of marketing citrus fruits. These articles vary from those of a most pessimistic order to those of calm, deliberate and conservative discussion of conditions as they exist with mere hints at the methods which might result in improvement.

The Citrus Industry welcomes these discussions. The more the growers study and discuss such topics, the sooner will a correct solution be reached. An interchange of ideas cannot fail to benefit the industry.

For itself, The Citrus Industry does not believe that the industry is headed for the demnition bow-wows nor the growers for the poor house. On the contrary, it believes that the Florida citrus growers will eventually find the proper solution of their marketing troubles, and that they will suffer no more frequent nor greater degree of adversity than falls to the lot of any class who win their living from the soil. Indeed, even at its worst, the citrus situation in Florida has never been comparable to the ills suffered by many growers in other lines, and The Citrus Industry believes that these conditions will steadily improve. It looks to the future with confidence.

That the Florida growers are confronted with problems of a serious nature which demand solution, all connected with the industry agree, but that these problems are beyond the ability of the growers to solve, The Citrus Industry does not believe. Just such discussions as these which are being carried in this magazine will doubtless play an important part in that solution, and for this reason The Citrus Industry welcomes such discussions and hopes that they may serve to bring out expression of many divergent views.

GET THE BUGS

The Citrus Industry regrets to note an inclination on the part of some growers to neglect the spraying, dusting or fumigating methods essential to the production of fruit of superior appearance. Whether this lack of interest on the part of some growers is due to a belief that insect pests are less numerous than usual, whether it is due to an inclination to practice false economy, or whether it is due to the recent real estate activity and a belief that fortunes are to be made out of grove lands rather than out of the fruit produced on the groves, we know not; but we do know that the grower who for any reason neglects to use every precaution to produce bright fruit will be the loser in the end.

Never has there been a time when the importance and absolute necessity of producing bright fruit has been so imperative as now. Florida produces citrus fruit of better quality than any other section, taken as a whole, but unfortunately, much of the fruit is not of superior outward appearance, and it must be remembered that by far the greater portion of the fruit is gauged by the buyer by its exterior appearance. Right now, outside competitors of Florida citrus producers are stressing the fine appearance of their fruits and buyers are being encouraged to still further exercise the present tendency to pass judgment by this standard. If Florida growers will take the proper steps to make their fruit appear as good as it tastes, no outside competition will be able to stand against it, but these steps must be taken if the grower is to receive the benefit and financial reward to which his investment and labor entitle him.

It matters not whether next year's crop be large or small, the necessity for combatting insect pests and diseases is paramount. If the crop is large, the buying public will select only the choicest fruit for consumption, while the fruit of poor appearance will bear the major portion of the loss. If the crop is small, the choice friut will still command a premium in every market. Either way, the producer of fruit of fine appearance stands to win.

And there is just one way in which the grower may be assured of producing fruit of fine appearance—by control of the insects and pests

which mar the appearance. This can be done only by eternal vigilance in the application of those methods which have been found effective in eradicating the pests. Spraying, dusting and fumigation are the three enemies of citrus pests, and properly used become the handmaidens of the growers in the production of quality fruit of good appearance.

Watch the groves carefully, and the moment any sign of suspicious character appears, get your sprayer, duster or fumigating tent in readiness for operation and begin the campaign of extermination. And the grower should not only watch his own grove, but he should be on his guard against the appearance of grove enemies in adjoining groves, and be prepared to take such steps as will protect his own grove.

The only growers who have made money in seasons of low prices have been the ones who produced bright, attractive fruit. The growers who have made the most money in years of high prices have also been the ones who produced the brightest, most attractive fruit. Whatever the market conditions may be, the bright fruit always commands the top price and returns the greatest profit to the grower.

Watch for the bugs and fight them. Use whatever method of warfare that has been proven best in your own locality for the control of the several pests, whether that method be spraying, dusting or fumigation—but use some method and carry the fight to the death.

Start now to get the bugs—and get them.

GROVE PLANTING

The Citrus Industry does not agree with the view recently expressed in some quarters that there should be a temporary abandoment of grove planting in Florida. It believes that the adoption of such a policy would be unwise, would be a detriment to the state and in the long run would react against the grower.

The Citrus Industry agrees that there should be a cessation of helter skelter, hit-and-miss, indiscriminate planting of groves by men who know nothing of the citrus game and who think all that is necessary is to plant any kind of trees on any kind soil, give them any kind of treatment or no treatment at all and expect to reap returns from the investment. Such planting has never profited the state nor the planter —and never will. But we believe that there should be continued intelligent grove plantings by men who know Florida and the citrus game.

The intelligent grower who will carefully study his soil, select the type of trees best adapted to that soil, get his nursery stock from established and reliable nurseries which have a reputation at stake, and who after planting will give his grove intelligent and painstaking care, aiming always at the production of the very best and most attractive fruit possible, will not only receive satisfactory returns on his investment but will be aiding in the development of his state along the lines of least resistance—the lines so clearly outlined by nature in making Florida pre-eminently a horticultural state. The planter who will make a close study of soil types, tree types, nursery stock, and grove methods, and the relation of each to the other, need have no fear as to the future of the industry so far as he is concerned. But the day of the helter skelter planter and grower, like of the day of the helter skelter real estate operator, is—and should be—over.

"CITRUS COMMENTS" OMITTED

Many readers of The Citrus Industry will regret the omission from this issue of our regular department, "Citrus Comments," by R. E. Lenfest. This omission is due to the illness of Mr. Lenfest at his home in Winter Park, and his inability to prepare an article for this issue. Our readers will hope for the early and complete recovery of Mr. Lenfest, whose department will be resumed as soon as he is able to again take up the work.

A CALIFORNIA ESTIMATE OF FLORIDA

Frank R. Cole, of Redlands, California, has been writing some observations about Florida to his "old home paper, the Redlands Daily Facts. From these letters we excerpt the following, which should be of interest to Floridians as well as Californians:

"Perhaps the writer is not competent to judge all Florida from having lived only in the Central portion. But it can be easily ascertained that thousands of people are coming here to live, and most of them are glad they made the move. No state can match the building activity of Florida, Orlando, with a population just recently past the 20,000 mark, issues building permits averaging over a million dollars a month. People are building all sorts of structures, from banks to bungalows. Houses are being built by the hundreds on the subdivided property. Inside and outside the city limits, on high land (for Florida) and low land (for any place). Communities are being built up around every golf course. Some sections have a $10,000 building restriction, and that puts up a pretty good framework, even in Florida.

"Perhaps I will be accused of writing to defend my personal judgment when I say that I have bought real estate here. In my case the investment has been very profitable and all of my acquaintances are making money. The growth around Orlando has been gradual and not of the mushroom variety. The land, especially near the business district is high priced, but in nearly all cases the value is really there. Realtors here do not sell you "from the map" or from lurid literature, unless you insist on buying that way. The salesmen have automobiles and beg you to go out and look at their property. Of course they are young men with a vision, and can see things hardly visible to the ordinary "prospect." In the better class subdivision you are offered many inducements to build. If you are buying for investment and resale you are usually given a reasonable estimate of your chance of profit.

"Hotel accommodations are scarce in most places and the rates are often rather high. There are all kinds of hotels and all kinds of prices. Florida was not prepared to keep up with the housing problem. There is bound to be some profiteering where such conditions exist, but the cities are gradually getting control of the situation."

The Effect of Fumigation with Hydrocyanic Acid Gas on Rust Mites

By W. W. Yothers

Owing to the favorable temperature and humidity conditions the citrust mite increases in numbers at almost a magical rate during March, April, May and June. After the rainy season begins a fungus disease of a most virulent character usually wipes the rust mites out. This fungus is so thorough in its work that many times throughout the summer and as late as October and November we have hunted for more than an hour in groves without finding a single mite. Of course such scarcity of mites is unusual. With the approach of winter they gradually multiply and by June they again reach their annual maximum numbers. While spraying should be done perhaps at several times throughout the spring and winter it is usually imperative if bright frut is desired to spray sometime in late May or early June. Of cuorse this applies only to those groves which have rust mites in abundance. In fact it looks as if spraying were omitted during the two months of May and June there would be little use in attempting to control rust mites. Of course I presume that it would be possible to spray or dust most thoroughly the last few days in April and again the first few days in July and still not suffer from rust mite damage. The risk however would be very great.

Practically all of the fumigation with hydrocyanic acid gas done heretofore has been done in the fall or winter and it has seemed advisable to give results of such work on the rust mites.

From 1906 to 1910 there was much experimental work done with fumigation for the control of white flies and scale insects. Dr. A. W. Morrill who had charge of the work, except the last year, observed that fumigation killed the rust mites which were present on the trees at the time of fumigation. Both he and I observed also that groves which were fumigated had the usual percentage of russet fruit. In the fall of 1918 the R. & H. Chemical Company carried on some fumigation work at three or four places in the state. Although the main object was to determine the value of this process in the control of white flies and scale insects it was deemed advisable to obtain as extensive data as possible on the effect of fumigation on rust mites. In accordance with this idea counts were made before fumigation and immediately afterwards and at several times (monthly intervals) throughout the spring until the period of maximum infestation had occurred. In most experiments regular white fly and scale dosages were used. The results are given in the following tables.

RUST MITE INFESTATION BEFORE AND FOLLOWING FUMIGATION
CARR'S GROVE—FLORENCE VILLA
Fumigated December 23rd & 24th, 1918

Date of examination.	No. of squares	No. of mites on top	lower	fruit	Total mites	Average per sq.	Remarks
CHECK, December 26, 1918 before fumigation	50	52	145	0	197	4	
December 26,	50	0	0	0	0	0	Saw the dead bodies of many mites on fumigated trees.
January 10, 1919.	100	0	0	0	0	0	
February 22, 1919.	200	0	2	0	2	.01	
March 28, 1919.	40	0	0	0	0	0	Trees just sprayed with lime sulphur solution for citrus scab.
March 28, 1919, new leaves (grapefruit	75	771	771	2135	3677	49.02	
May 28, (grapefruit, old leaves	20	28	36		64	3.2	
May 28, (Oranges)	75	23	1	28	52	.69	

It will be seen from this table that the fumigation killed perhaps all rust mites present but by the last of May they were practically just as abundant as if no fumigation had been done.

RUST MITE INFESTATION BEFORE AND FOLLOWING FUMIGATION
CHASE & COMPANY'S GROVE, ISLEWORTH, FLORIDA
Fumigated November 29—December 4, 1918
(Oranges)

Date of examination.	No. of squares	No. of mites on top	lower	fruit	Total mites	Average per sq.	Remarks
Nov. 22, 1918, CHECK before fumigation.	50				456	9.1	
Dec. 13, 1918	50	0	0		0	0	
Jan. 17, 1919	62	0	4		4	.06	
Feb. 28, 1919	100	0	19	0	19	.19	
Mar. 10, 1919	50	0	6		6	.12	
CHECK, Mar. 10, unfumigated.	50	0	4		4	.08	
May 27,	66	186	29	384	599	9.0	Should be sprayed within 2 or 3 weeks.
CHECK, May 27, unfumigated.	17	1	3	92	96	5.6	

This table shows even more strikingly the development of rust mites than the proceeding one.

In another grove there was present 14.3 mites per one-half inch square before fumigation. After fumigation there were no mites present. On May 28th there were approximately 7 mites per one-half inch square.

On December 13th, 1918 a count was made to determine the abundance of rust mites on foliage that had been fumigated the night before.

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Farm Equipment

Progress In the Development of Farm Equipment

Address by A. E. McKinistry, Vice-President, International Harvester Co., Before the 32nd Annual Convention of the National Association of Farm Equipment Manufacturers, Chicago, Ill , October 29, 1925

In discussing the progress in the development of farm equipment I want to review briefly some of the more recent developments and sum them up into a showing of the advance our industry has made and is making as a whole.

This task, as one tries to condense the subject to the extent necessary in this review, seems rather overwhelming. The field of discussion is so broad that at best one can touch but few of the high spots.

The temptation is strong to go back to the beginning of our industry and review what is to me one of the most wonderful chapters in all the history of American progress—the miracle that was wrought upon our national life and for the world by modern farm equipment. But that story has already been told too often and too well for repetition here, and so I purposefully limit myself to the mechanical progress of our industry in the last quarter century.

It is well for us to pause and give serious thought to this progress. Is it as great as it should be? How well have we as an industry fulfilled the purpose for which we exist? Are the people we serve satisfied with our service? How do we appear in the eyes of others?

Have you ever looked at farming from the disinterested point of view of the city man who has long lived apart from the farm? As he goes through the countryside he sees on one hand the plowman trudging behind his team, slowly turning the furrows. He sees the old famliiar teams stumbling along in the dust raised by the ancient smoothing harrow. He sees the old familiar mower and the hay rake with its missing teeth. Sometimes in the fall he sees the farmer harvesting his corn crop with the corn knife. In the old cow barn, its gloomy interior a total stranger to sunlight, he finds the same old wooden stalls. In the yard he sees the housewife carrying pails of water, and he says to himself—"Well, farming hasn't changed much. It's just about the same as it was when I was a boy."

And so the city man expresses the opinion, especially if he be a cog in our great, industrial mechanism, that there hasn't been much progress in farming; that the farmer still uses the same old machines he used twenty-five, thirty, and even fifty years ago.

This is the point of view of some who claim that we are not going fast enough and that our development of today does not represent as great progress as has been made in some other lines of effort. Is this a sound view point? Yes, and no. The man who holds it has seen but one phase of farming—an altogether too familiar phase it is true—and from it he has drawn the wrong conclusion and so passed judgment on our industry.

What he has seen can be seen by anyone, even in some of our very best agricultural sections. Considerable areas of this country are farmed in somewhat the same manner. America's great staple, cotton, is largely produced by one-mule, one-man methods which have changed little since the civil war. In some of the older sections of the United States one may find on many farms a line of equipment which has served the present owner and his father before him.

A somewhat similar condition can be found, however, in practically every other industry. We all know that not every mine has up-to-date equipment, that not all our railroads have the most modern locomotives, cars and signal systems. Not every print-shop has the latest printing presses, and not every factory has brought itself up to date in shop equipment. There will always be those who fail for one reason or another to keep abreast of the times.

It would not be fair to judge our manufacturing industry or mining industry by those shops or mines which are still using equipment of a past day, nor is it fair to judge the entire agricultural industry by the farms which still use out-of-date equipment. Such farms, taken by themselves, do not represent the progress of our industry. On the other hand, they do confess a lack of progress by not adopting the improved equipment this industry has developed. The fact that one-eighth of the Illinois farms are still plowed with a walking plow is not an indication of lack of progress in the improvement of farm machines; nor is the fact that 90 per cent of the cows are milked by hand to be taken as proof that manufacturers of dairy equipment are now asleep.

One obvious way to get at the facts about the development of farm equipment would be to go down the list alphabetically or by groups, and enumerate the new machines and appliances that have been offered to the farmer. Then we might itemize and enumerate the improvements that have been added to old lines increasing their efficiency. But that would be an overwhelming task. It would require an encyclopedia merely to catalogue these things with a brief description of each.

In considering the progress of our industry, let me emphasize the fact that there have been very few if any new crops grown by American agriculture during the last quarter of a century requiring new lines of equipment. The problem has been largely one of improving old machines and developing additional machines to reduce farm operating costs and heavy labor.

Soy beans, a new and popular crop, has demanded a soy bean harvester, several models of which are now available, and the Kafir corn-grower's plea for a header to harvest his crop has been answered. As for one of the oldest and most important crop-handling problems, that of picking cotton, reports now indicate that the century-long effort to design a practical mechanical picker is at last making some headway.

To the man seeking signs of progress, let me suggest a visit to a well-equipped dairy farm. It is not many years since the pitch-fork and a three-legged stool were the only barn equipmen needed in the dairy, and then the cow was noted for her ability to drive the boy off the farm. Today on our best dairy farms the barns are well lighted and thoroughly ventilated, equipped with sanitary steel stalls, swinging stanchions, drinking cups at the cows' heads, highly developed feed and litter carriers, and

electrically operated clippers and brushes.

The cows are fed on engine-ground meal and engine-pumped water; they are milked by a motor or engine-driven sanitary milking machine, a development of the last decade. In 1912 there were less than 200 milking machines in use in this country, while twelve years later there were over 100,000. The milk is handled by a mechanically-driven cream separator, a vast improvement over the machines of twenty-five years ago in skimming efficiency, sanitary features and power requirements.

Much of this progress has been stimulated by the development of the farm gas engine, electric light plant, and water system. The farm engine can rightfully be classed as a product of the last quarter century. Although gas engines are considerably older, the development of our farm engine did not take place until after the expiration of important patents in the nineties.

The silo has become a standardized product. Its erection and maintenance have been made easier and it is more certain of long life and permanency.

The ensilage cutter has shown decided improvements based on scientific investigations which have been of great importance to agriculture. The University of Wisconsin tests of all cutters offered have disclosed facts upon which manufacturers have been able to build machines of greater efficiency.

The cistern and the shallow open well with its old oaken bucket, long celebrated in poetry and now notorious for the germs it harbored, and the old pump, a wooden post with a handle, have given way to modern water systems made possible by the self-oiling windmill, the gas engine, electric motor, and the force pump. Now there is hot and cold running water in the farm kitchen the basement, and the bathroom, and a plentiful supply of pure water for the livestock.

Probably no field offers greater evidence of improvement than the pump and the water supply system. At present there is a movement among the agricultural colleges to show the American farmer how to install running water in his home. Manufacturers have been ahead of the demand with windmills, hydraulic rams, and electric power for this job.

Our present-day lighting plant, a product of recent years, contrasts strongly with the collection of generator, engine and storage battery of fifteen years ago which probably brought owners as much grief as comfort. More and more farm homes are being electrically equipped.

May I pause for just a moment to point out what the natural results are when modern equipment finds its place on the farm and in the home? For instance, following the installation of the lighting system, the hand washer and the wash tubs are replaced by a power washer. The vacuum cleaner replaces the broom, and the electric iron the old flat iron. In comes an electric fan, and logically a better water system. As the electric lights are turned on in the home, the wall paper, the carpet, and the furniture that seemed quite satisfactory in the dim light of the kerosene lamp lose their attractiveness, and then follow new household furnishings of every description. With a better system of sanitation comes higher standard of living, all set in montion by products of this industry.

High-pressure spraying equipment, made possible through the perfection of the small gas engine, contrasts strangely with the old hand-power, low-pressure sprayers of not so long ago. Power dusting apparatus for cotton, fruit, and vegetable crops is a very recent development of great importance. Seeding equipment, manure spreaders, motor trucks, and countless other products of our industry, are receiving the constant attention of the best engineering talent available.

For handling corn, the industry has devised machines by which the hand work, which persisted longer in harvesting this crop than any other except cotton, can be entirely eliminated. The corn binder has been available for many years, but for the man who had an extensive acreage and wanted only the corn, something had to be provided to take the place of the hand pickers and the old bang board. The corn picker has met that requirement.

To lower the cost of growing corn, there was great need for a faster method of cultivation than was provided by the one-row riding cultivator. This industry has perfected the two-row cultivator, so efficient that with it a boy can do as much as two men with older types of machines.

The grain farmer has been equally well served. With the perfection of the binder, the grower of small grains probably thought that his harvesting problems were at an end. Here again changing conditions have made further development necessary. The planting of large areas to grain and the expense involved in the usual methods of harvesting demanded faster work.

The eight-foot binder, long supposed to be the last word in binder construction, is being replaced on many farms where power is available by the ten-foot power-drive binder with which one man can cut thirty-five acres a day. A still further development has been the perfection of the small harvester-thresher, or combine. This machine is a product of the last few years, and it has made a tremendous reduction in labor and harvesting costs.

The small thresher with all attachments is a development of the last fifteen years. That it has been welcomed everywhere is evidenced by the increasing proportion of these outfits over the large custom rigs of the past.

The farm tractor is, of course, a conspicuous development of the last twenty-five years.

I wish I might mention here the names of all those men of our industry who, twenty-five and thirty years ago, had the vision of a perfected power unit to lighten the work of men and animals and strove to develop a gas tractor for that purpose. The early tractor builder, first recruited from the implement men, was a pioneer as surely as the hardy soul who loaded his family in the old prairie schooner and turned his face westward.

During the first ten years, up to 1910, progress was necessarily slow. It took a few more years to develop a tractor that was of a size and price to be within the means of the average customer and yet powerful enough to meet both drawbar and belt demands.

Slowly, as seen at the time, but rapidly when we look back over the years, came the development of special implements designed for use with the tractor. First came the tractor plow and then the tractor disk harrow, followed by the power-life drill, the field cultivator, the tractor binder, and a long list of other implements each with its multiplicity of new devices for one-man control of both tractor and implement.

Lastly has come the perfection of the power take-off by which the power of the motor is directly applied to the mechanism of the drawn machine. Bull wheels and ground wheels are losing their importance.

The industry has been alive to the row-crop farmers' needs. As row-crop acreage is approximately 40 per cent of our total cultivated area, the importance of this problem is apparent. To meet it the general purpose tractor and the motor cultivator are now available.

The introduction of the tractor has sent a thrill of new life through ag-

riculture. The great difference between our present civilization and previous civilizations is that we use mechanical power while they used animal power, and, before that, man power. Agriculture is the last industry to be put on a mechanical power basis. The farmer is now on an equal footing in producing commodities to be exchanged for the products of other workmen who have long sup planted or supplemented their own muscles with mechanical energy.

Our industry has sometimes found itself in the cross-fire of two groups representing conflicting opinions. One group thinks we have not standardized enough on our older machines; the other thinks we have standardized too much. There has been a great deal of publicity emphasizing the standardization being done in other industries, and there are some enthusiasts who go so far as to declare that all farming operations involving vast differences in soil, crop, and climatic conditions should be performed with a standardized type and size of each different tool. This idea is directly contrary to another group which claims that the development of new machines by our industry has not been as rapid as similar development in other industries. These standardization enthusiasts apparently do not realize that if the earlier makers of farm implements had adopted such a standardization program, the farmers would still be using the walking plow and the reaper. PROGRESS CANNOT BE MADE MERELY BY CONTINUING TO PRODUCE ANY STANDARD ARTICLE OF COMMERCE.

The implement industry has not neglected the problems of standardization. In spite of the fact that its products offer perhaps more obstacles to complete standardization than almost any other industry, it has made very definite progress in this respect. Standardization, through the elimination of many unnecessary styles, types, and sizes, has been going on for a number of years and has accomplished worthwhile results. Undoubtedly there is room for still further improvement along this line, but it must be made slowly if it is not to cause serious inconvenience and expense to all concerned.

You are doubtless familiar with the fact that, in spite of the insistent demand from some quarters for the standardization of farm machines the industry did not receive the support of the consumer in its efforts to eliminate the left-hand plow and the wide-track wagon. On the contrary, farmers accustomed to using such plows and wagons insisted on having them and the manufacture of these lines was resumed.

Some fundamental standardization work is still being carried on which will bear excellent fruit in the future. This work includes standardization of materials and elimination of many sizes now called for.

We might continue at length reviewing progress in specific lines, but the best way, after all, to measure this development is in terms of what it has done for the farmers who have taken advantage of it. It is obvious that any advance in the development of farm equipment should result in an increased output of crops per man. The larger this increase, the greater must have been the improvement.

In this connection, we find a recent statement by the United States Department of Agriculture to the effect that the average agricultural worker who could formerly care for only 12 crop acres now handles 34. In some states this new average is 100 acres. Even with the trebling of the number of acres handled and a corresponding increase in the quantity of crops which one man can raise, the worker's hours have been considerably shortened and much of the drudgery and monotony of farm work has been eliminated. That, gentlemen, is the best answer to the man who asks whether there has been progress in our industry in the last twenty-five years. Fortunately, too, the answer is not provided by us; it comes from an unbiased, authoritative source.

IF ANY CRITICISM CAN BE DIRECTED AT US IT IS BECAUSE OF OUR LACK OF AGGRESSIVENESS IN SECURING EARLIER AND WIDER ADOPTION OF IMPROVED EQUIPMENT. PROGRESS IN THE DEVELOPMENT OF THIS EQUIPMENT FAR OUTSTRIPS PROGRESS IN ITS ADOPTION AND USE.

A government survey published in July, last, indicates that 93 per cent

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The Perfect Spray for Citrus Scab

PERFECT because of the certainty of results; perfect because of the economy in cost; perfect because of the excellence of the fruit that is produced.

No supplementary spraying for scale control is necessary when you use Bordol Mulsion. It is a carefully balanced combination of copper and oil giving thorough control of citrus scab, white fly and scale with one application. It mixes readily with hard or soft water.

You need not experience again the grading down of your fruit when it goes to the packing house, because of scabbiness. You need not suffer the loss of 50c or 75c a box for your fruit because of scab blemishes. Bordol Mulsion applied before bloom will control the scab and make fruit of the greatest beauty.

Give your grove a thorough spraying with Bordol Mulsion this Spring. It is a certain profit maker. Quick deliveries from dealers' stocks or direct from us.

Send for New Catalog describing our entire line of spraying and dusting materials and machinery which also includes simplified spraying and dusting schedules.

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J. SCHNARR & CO. ORLANDO FLA.

of our farmers have not yet adopted mechanical power for field work. Contrast this with the same authority's estimate that 70 per cent of the farms of this country have automobiles.

Every farm should have a small gas engine, yet only 40 per cent are so equipped. Less than 10 per cent have modern lighting systems. A survey of Illnois farms shows that 70 per cent are not tractor equipped. Milking machines, power sprayers. and many other highly developed products, in which our industry takes pride, are still largely strangers to the farms of this state.

Reflecting that Illinois stands at or near the top of the list in farm production and prosperity, we can realize that our industry has a long way to go before it will have equipped the farms of the country fully and efficiently with machines and appliances that have been on the market for years.

It is true that many farmers do not use more modern equipment because they cannot afford it or because the acreage farmed does not justify it, but it is also true that more farmers do not use it because they have not realized that it is poor economy and poor business to cling to an old, obsolete, and perhaps badly worn machine when a new machine of greater capacity would materially cut down costs. They have not yet grasped the significance of saving time. The fact remains that the country has too much small-capacity equipment. THERE ARE STILL TOO MANY IMPLEMENTS WITH HANDLES ON THEM INSTEAD OF SEATS.

I have attempted to develop the fact that the inventive genius of the industry has not been at fault. Modern, labor-saving equipment is ready and on the market; the industry has provided the means for a broad gauge stimulation of economical crop production, but the buying impulse is still too weak. The utilization of modern equipment in order to put farming on a new and profitable plane is in need of encouragement.

It is not because the industry has given him nothing new or more efficient that the farmer is poorly equipped and has been staying out of market. At every point in our history we have been ahead of the times. True, during recent years the farmer has not had available funds to buy freely. Prices of farm crops have been too low, which has placed him at a disadvantage in exchanging the products of his labor for the products of other labor. But we should not overlook the fact that high production costs on the farm, due to a lack of labor-saving equipment, have added to the burden. With high costs and low prices there was no chance for a profit. The question arises here, have we sufficiently emphasized the importance of good equipment in lowering these costs?

For instance, our agricultural colleges and other governmental agencies whose sole object is the welfare of agriculture have been studying, investigating and talking about everything connected with agriculture except one of its most important features—farm equipment.

I want to read you a quotation bearing on this point, as follows: "Agriculture is prone to use antiquated methods. Whose fault is it? The agricultural experiment stations have given little or no attention to this phase of agriculture. The time and money have been spent on soils, fertilizers, lime, seed, etc. These are very fine and have gotten good results and helped agriculture immensely. But the fact still remains that power and labor costs seem to be the limiting factor in getting profits out of agriculture."

The author of that quotation is a professor in one of our leading agricultural colleges.

With hardly a word of protest we have permitted writers to give publicity to everything else under the sun, year after year, and ignore farm equipment. Lately we have endeavored in a measure to correct this situation through the organization of the Research Bureau, but here again we cripple its activities by withholding sufficinet financial support.

To insure increasing agricultural prosperity during our generation, there must be a further reduction of farm operating costs. The only important factor in operating costs which a farmer can control is the combined expense of labor and power. According to government estimates, this factor is the greatest in the problem, representing about sixty per cent of operating costs. How is the farmer going to cut down his labor and power costs?

The only plausible and reasonable answer to that question is in the hands of the equipment industry. WE ARE FULLY MEETING OUR RESPONSIBILITIES AS THE PILOT OF AGRICULTURE THROUGH OUR ENGINEERING LABORATORIES AND OUR WORKSHOPS. It only remains for us to find a way to secure the more rapid and more general adoption of the labor-saving, profit-making machinery which our industry has already made available.

THE EFFECT OF FUMIGATION WITH HYDROCYANIC ACID GAS ON RUST MITES

Continued from page 14

In fifty squares not a single mite was found. On the row adjoining the fumigated row, fifty squares had 441 mites or 8.8 mites per square.

An examination of the foregoing data proves that fumigation with hydrocyanic acid gas kills rust mites and in all probability a majority of the eggs present. It is also indicated that however complete the killing may be at the time of fumigation, which is usually before February 1st, the rust mites will be just as abundant in late May and June as if no fumigation had been done. The same situation usually exists if spraying for rust mites is done in the late winter or early spring. Unless fumigation can be done during the months of May or June it is evident that fumigation can not be practiced for rust mite control on citrus trees in Florida. If it becomes practicable to fumigate for scale insects and white flies in May and June there would be no reason of course for doubting the effect of fumigation on rust mites. If it can not be done during these months this method would have little or no value for controlling rust mites.

WHY ONE BOY LEFT THE FARM

I left my pa, his farm, his plow
Because my calf became his cow;
I left my pa—'twas wrong, of course,
Because my colt became his horse.
I left my pa to sow and reap
Because my lamb became his sheep;
I dropped my hoe and stuck my fork
Because my pig became his pork;
The garden truck I made to grow
Was his to sell and mine to hoe.

Why This Boy Remained at Home

With pa and me it's half and half—
The cow I own was once his calf;
No town for mine, I will not bolt,
Because my horse was once his colt.
I'm going to stick right where I am,
Because my sheep was once his lamb.
I'll stay with pa—he gets my vote—
Because my hog was once his shoat.
It's fifty-fifty with pa and me—
A profit-sharing company.

—Selected.

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New PRICE LIST of regular brands just issued. Get same before placing order. Send orders now for future requirements, save delays and be ready when fertilizer is needed. Transportation is slow and may be worse. QUALITY first, FAIR prices, Prompt shipment.
E. O. Painter Fertilizer Company
Jacksonville, Duval County, Florida

PREPARE TO COMBAT PLANT LICE WHICH MAY GIVE TROUBLE

Gainesville, Fla.—Florida truck crops are liable to attack by the aphid or plant louse, one of the most damaging as well as most widely distributed pests with which growers have to contend. At times, especially during dry, hot weather, entire fields of cucumbers, watermelons cabbage, and other vegetable crops are often badly damaged or entirely destroyed by this tiny insect.

According to M. R. Ensign, extension truck entomologist, experience and experiments show that the aphid first appears in a few spots in the field. From them it rapidly spreads to adjoining plants and under favorable conditions soon covers the entire field.

If the grower will keep careful watch of his plants during the growing season, he will have no trouble in detecting the first few plants to be attacked. Then, and right then, is the time to strike. To paraphrase an old adage, a shot of dust in time will save nine.

The grower should carry a hand duster to which is attached a cone made of some light material which can be held over the plants while the dust is applied. The cone may be made of metal (galvanized tin of light weight) or of muslin cloth stretched over a wire frame. The cone will prevent the dilution of the dust due to air currents, and by allowing it to remain over the plants for a few minutes, a 100 percent kill is assured. Nicotine dust should be used.

In case the aphids have become more general, the field should be treated with an application of nicotine dust, tobacco extract or a liquid spray (usually with Bordeaux mixture to which soap or a caein sticker has been added). This may have to be repeated after a few days.

SOW CARPET GRASS AND LESPEDEZA FOR PASTURE THIS MONTH

Gainesville, Fla.—March is a good time for sowing pasture grass mixtures of carpet grass and lespedeza, says W. E. Stokes, grass and forage crops specialist of the Experiment Station. Carpet grass and lespedeza are recommended for good lands in northern and western Florida and carpet grass for good flatwoods lands anywhere in the state.

Where this mixture is being sowed for the first time on land, the land should be cleared and free of dead bunches of grass and undergrowth. Thorough preparation of the land before planting where this is possible is also beneficial.

Ten pounds of carpet grass and five to ten pounds of lespedeza seed per acre sowed broadcast and lightly scratched in with a weeder or spike-tooth harrow and kept mowed or grazed enough to keep down weeds and tall native grasses this summer will result in the establishing of a good permanent pasture of carpet grass and lespedeza in 12 to 18 months.

Once established, no more planting and preparation are necessary—just keep grazing the pasture and occasionally during the summer run the mowing machine over it to cut any weeds and small shrub growth.

Seed of carpet and lespedeza can be obtained from Southern seedsmen. See your county agent or write the Experiment Station if interested.

PROTECT POTATOES FROM DISEASES BY REGULAR SPRAYING

Gainesville, Fla.—Due to high prices for potatoes, a considerable acreage is being planted to this crop this year. Although much of it is off to a late start on account of wet weather, still it should come on in time to secure good prices.

The good prices in prospect for the crop make the question of disease prevention doubly important. Late blight is a serious disease that affects Irish potatoes more or less every year. Some years it may not be serious, but the grower can scarcely afford to take chances.

Dr. L. O. Gratz, assistant plant pathologist working on potato diseases, has found that late blight can be effectively controlled with either 20-80 copper-lime dust or 4-4-50 Bordeaux mixture. The Bordeaux should be sprayed under a pressure of about 200 pounds. It is important to either spray or dust before evidence of the disease is seen in the field to prevent the disease. Once the disease gets a start, it cannot be controlled. The first application of spray or dust should probably be made about the time the plants are six inches high. Additional applications should be made every 10 days or two weeks.

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European Plan, Fireproof 300 Rooms With Baths

THE CENTER OF TAMPA

Skelly, F. L. Citrus Fruit, Estimate

Normal Fruit Crop Is Predicted for Coming Season, Says Skelly

In an interview regarding the outlook for the next citrus season F. L. Skelly, manager of the American Fruit Growers Inc., Orlando, stated that he had recently received numerous inquires not only from growers but from interested parties in other lines of business on this subject, and expressed his views and the attitude of the American as follows:

"While it is early to attempt any definite predictions as to the size of next season's crop, yet, if present prospects materialize and barring any disaster, there will probably be a normal crop next year. However, Florida has had normal crops before and this fact alone need not arouse serious fear as to the result. In fact this is what every individual grower in the state strives for every year.

"In our opinion it is a serious mistake for one to become pessimistic at this time on next season's prospects, certainly merely because of the possibility of a normal crop in Florida, and such pessimism is not justified. We do not believe in a false optimism and we believe that every situation should be looked squarely and cooly in the face, in order that it may be in fact accurately estimated and proper plans laid for meeting it, but without undue excitement or apprehension.

F. L. SKELLY

Manager American Fruit Growers Inc., Orlando, Florida. Mr. Skelly looks forward to a normal crop next season, and believes that it will bring the grower normal prices.

"Under ordinary conditions, when large crops are produced no reasonable man expects that the season will show average per box results as high as when the crop is short, but that does not necessarily justify any anticipation of disaster. It is true that Florida has had seasons of heavy crops when the average results throughout the state might be properly termed disastrous, but we must remember that such was not the result of the size of the Florida citrus crop alone.

"For instance, in the last instance of that kind the citrus season had been preceded by abnormal production of practically every line of perishable products throughout the entire preceding spring and summer, and it was accompanied by a heavy production of fruits which were directly competitive with citrus fruits, as well as an abnormal crop of California citrus that same year. At the same time the general economic condition of the country was none too good, with considerable pessimism as to the general outlook.

"The entire buying public had become accustomed to low prices on every line of fruits and vegetables before the Florida citrus season opened, and with the liberal supplies of both citrus fruits and competitive lines, with the general conditions above described, it would have been almost miraculous if citrus prices should have been maintained at a satisfactory level.

"The citrus results of that season, therefore, were determined very largely by this very unusual combination of circumstances, each of which undoubtedly exercised its distinct influence, and were not by any means due to the size of the Florida crop alone. To this must be added two other distinct influences which we are

inclined to believe were as seriously destructive that season as any other single factor. One was the wide publicity given to the agitation and accusations of the shipment of immature fruit, which, whether it be deemed to have been necessary or not, was certainly very unfortunate. The second was the widespread and apparently entirely unnecessary publicity that was spread all over the United States during a period of many weeks arising out of the discussions of the question of over-production in Florida that season and reflecting the apparent beliefs of some citrus interests within the state itself as to inability to successfully handle the existing output. Both of these things were undoubtedly serious, exercising a deterrent influence on any liberal buying or speculation in futures on the part of the trade in general and tending strongly to the production of a buyer's market that season. We endeavored to call attention to that fact at the time.

"Such a combination of circumstances and conditions is in reality very unusual. We believe that the cause for green fruit agitation has been substantially removed, and certainly the error of giving publicity to fears of disaster because of normal production should not be repeated, particularly since it is not justified. It is entirely too early to predict with accuracy the production of late spring and summer crops of perishables or the final output of apples or other fruits competitive with citrus next season. Moreover we do not believe there is cause for a pessimistic attitude as to the general condition of the country and its buying capacity a year hence.

"As stated before, we do not deceive ourselves by a false optimism. At the same time we feel that to enable anyone or any organigation to successfully handle a situation it it should preserve an optimistic attitude and outlook, certainly where the facts do not compel an opposite view. We feel that there is no present cause for alarm as to next season. At the same time and as a matter of course, we feel that every marketing organization should take steps as always to place and keep itself in the best possible position and most efficient condition for taking care of the volume of business which it may have to handle and to broaden and strengthen its outlet. This is the attitude and policy that our own organization is pursuing.

"From the standpoint as a policy the American Fruit Growers, Inc., has for 1926 doubled its advertising appropriation for the past year and its plans involve not only a more extensive use of newspaper advertising and dealers' helps in the markets but also the use of national periodicals, such as the Saturday Evening Post, and an extension of its existing operations in the European markets. Parallel

Continued on page 24

USE "BLACK LEAF 40"

It gives you Extra Insurance Against Aphis

Take advantage of this 2-fold control. When you spray with "Black Leaf 40" you kill Aphis and Thrips, not only by direct contact (or hitting) but also because of the "gassing" effects of the volatile Nicotine fumes which arise through the trees. Likewise, when you dust with Nicotine Dust, insects are killed by actual contact of the dust with their bodies and also by the powerful nicotine gas.

Ask Your Experiment Station

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"Black Leaf 40" Kills Aphis
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Between 400,000 and 500,000 Buds

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Valencia,	Tangerines,	Marsh Seedless Grapefruit
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on sour orange or grapefruit stocks.

When you have inspected and priced our Buds, you will then know where to place your order to the best advantage, and we believe it will be with us.

Lake Nursery Company

LEESBURG, FLA.

Citrus Fruits, Marketing

THE GROWERS' OWN PAGE

This department is devoted to the growers, for their use in giving expression to their views and a discussion of growers' problems. Any grower is welcome to make use of this department for the discussion of topics of interest. The only requirements are that the articles must be on some subject of general interest, must be reasonably short and must be free from personalities. The editor assumes no responsibility for views expressed, nor does publication imply endorsement of the conclusions presented.

BETTER MARKETING ESSENTIAL

Winter Haven, Fla.
February 26th, 1926

Editor,
The Citrus Industry
Tampa, Fla.

Enclosed find check for renewal of subscription to your valued publication which it is pleasure to do since your periodical is so thoroughly fair and impartial, having gained thereby the esteem, respect, and confidence of its readers. I have found your publication truly independent, "representative of every interest, representing no special interest," throwing its columns open to the public and giving to every interest full opportunity to express its views without fear or favor, thereby securing opinions from all sides so that your readers are able to form correct conclusions, having all the facts.

Now, as several of the principal citrus marketing agencies have been heard from through their managers and advocates, don't you think the growers should be allowed to tell their story, particularly as they have to pay the bill and are naturally much interested in the situation?

I have just been reading a very interesting article on "Wise Management". It proves most emphatically that no matter what the situation may be the chances for success are almost impossible without wise management. One of the most prominent and successful men in the country with a constantly growing fortune represented by nine figures was asked the question, "In employing an executive for a very responsible position, what would you require?" The gentleman replied that he would require fitness, honesty, efficiency and energy—one who has proven he can produce.

The citrus situation is in a demoralized condition and I have taken the liberty of sending you this article which I hope you may be able to use, at least, in part, not for any glory I may get out of it but in hopes that it may cause some of your numerous readers to realize where we are drifting.

There are several more marketing agencies than there were a year ago and there were too many then. The former president and former general manager of the Exchange have formed a new marketing agency in competition with the Exchange. In our own town former prominent members of the Exchange have formed an organization in competition with the Exchange. So it goes all along the line. It seems strange that some of the most active opposition to the Exchange now comes from persons who were formerly connected with it.

There is a great deal of ill feeling existing between the different selling agencies with much criticism of each other and it is utterly impossible to get them together on any harmonious basis. So the growers will be compelled to put them aside, not permitting them to dominate us, for the growers must act independently, free from any outside or selfish interest.

It is the duty of every true citizen of Florida to do everything in his power to help solve this problem upon which the prosperity of the state depends. It is my sincere hope that the publication of this article may arouse the growers to the critical situation and cause them to act in a vigorous manner as our prosperity depends upon such action.

Co-operation among farmers is gaining an amazing headway. There was recently held in Philadelphia a very interesting and beneficial session of the American Institute of Co-operation, being attended by some of the ablest men in America. The Government is doing all it can to help along co-operation among farmers, passing laws so that these farmer associations may make combinations without incurring penalties. More than one-half of the total agricultural production of California is now marketed through associations, organized and controlled by the farmers themselves. The Citrus Exchange of California is composed of over twelve thousand loyal and zealous members, controlling a large majority of the crop and all working in harmony. The principles upon which the organizations of California are based, has to do with efficient management. Their motto is that experienced business executives rather than farmer management is a prerequisite to success. The Honorable W. M. Jardine, U. S. Secretary, of Agriculture, says: "Successful co-operative associations must have efficient and experienced management."

The Burley Tobacco Association of Kentucky is a noted example of the wisdom of employing the best competent executives with proper payment for services. This association brought into the Burley area in 1923 fifty million more dollars than the crop produced in 1921. Many similar examples could be given.

Why can't we use the same policy in making citrus business a prosperous and paying industry? If in the Exchange there are any cliques, get rid of them, with the same treatment to any directors who may be trying to run the business, interfering, in many things which should be exclusively under the direction of the executive. One of the big business men of New York says; "when the directors try to run the business, then there is nothing else to do but get a thorough change of officers as they are useless, being without authority." The biggest and most successful manufacturer in the land says "one of the greatest misfortunes that can befall any business is to be directed by men who don't know it. The only reason for an industry's existence is when it is managed by men who know the job."

The man at the head of the California Exchange went in as an office boy working up to his present position, being thoroughly competent and conducting the business to the satisfaction of the growers. Have the past and present officers of the Florida Citrus Exchange had the same training and experience?

With many things in our favor and the shining example of other states, we cannot support one good, live, wide awake co-operative association. We seem to be almost hopelessly divided into a host of parties endeavoring to cut each other's throats. This is not only division but "sub-division" carried to the extreme. The great thing lacking is confidence and until this is fully restored we will be going from bad to worse. Here we are trying our best to persuade the rest of the world to come and

Continued on page 26

The New Spray for Aphis

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"IT KILLS APHIDS"

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Mixes with Other Sprays
Can be used with Hard or Soft Water
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A Monthly Magazine devoted to diversification in fruit growing and to home and civic ornamentation.

The kind of a magazine you will enjoy in your home. It tells of the different kinds of fruits which can be successfully grown in Florida and it aids with helpful suggestions about ornamentals and flowers for your home or community.

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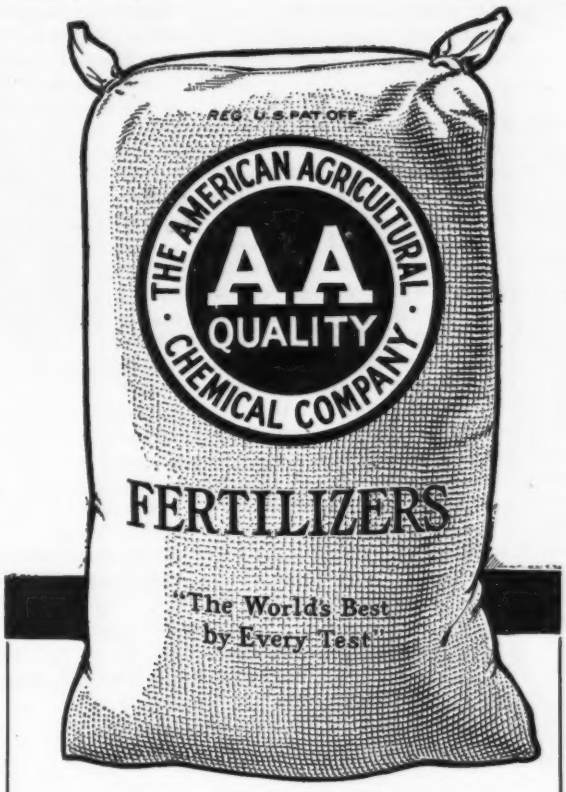

Get the "big prices" for your citrus fruits

Make sure of clean, high-colored, rich-flavored fruit—the fruit that commands the "big prices"—by giving your trees exactly the plant foods they need to produce such fruit.

You can be sure they get these foods by using

BRADLEY'S and COE-MORTIMER

Special Citrus Fertilizers

These are "AA QUALITY" Fertilizers in every sense of the word. They contain exactly the materials needed by citrus trees for healthy growth and heavy yields. They are in form that are readily assimilated by the trees.

"AA QUALITY" FERTILIZERS

Manufactured by

The American Agricultural Chemical Company

Byrne Bldg., Jacksonville, Fla.

NORMAL FRUIT CROP IS PREDICTED FOR COMING SEASON SAYS SKELLY

Continued from page 21

with this, our organization constantly endeavors to strengthen its efficiency in every respect to make it capable of successfully handling any situation that may arise.

"I have already said that every grower normally strives to produce a normal crop. That is both natural and right. One thing to be remembered, however, is that a grower should strive not merely to produce a normal quantity of fruit but particularly that his production be of the finest possible average quality. Nothing counts more in final total results than the average of quality. Another thing that should be distinctly remembered in this connection is that whereas with a large production the average net per box is normally not as high as when the crop is short, yet, even with a lower net per box but with a larger crop, the results per acre to the grower may and probably will be larger than with the smaller production, and the total results of his operations are what count to the grower.

"Throughout its history in the past Florida citrus fruit has been one of the greatest sources of revenue in the state for growers who have consistently given proper care to their groves, and this will hold true in the future. Good Florida grove property is selling today at very satisfactory prices, and we have no doubt it will continue to do so and fully justify the investment. We do not look upon the future with discouragement but approach next season with a sane but optimistic enthusiasm, realizing the possibilities of a sizeable crop to be handled, which properly should be a cause for thanksgiving rather than regret, and lay our plans to efficiently take care of it without fear of the outcome. We believe this is the only correct attitude and the only attitude that is justified by conditions as they are today, and that any grower who will expend the proper attention and effort on the production of high class fruit, supplemented by proper harvesting and packing and efficient marketing, need not have serious fear as to the results."

DR. FAWCETT'S NEW BOOK SOON FROM THE PRINTERS

Dr. H. S. Fawcett's new book, "Citrus Diseases and Their Control," will probably be ready for distribution by April 15, it was reported at the meeting of the Lemon Men's club in February. The retail price will be $5, but the Lemon Men's club which has guaranteed distribution of 2,000 copies will offer it to California citrus growers for $4 each.

J. D. Culbertson of Santa Paula reported that the work would be of about 500 pages with 15 colored illustrations, 141 half tones and many drawings, making a total of 205 illustrations. He stated that books of like nature ordinarily sell for from $7.50 to $15 each.

Each citrus association is to be circularized and managers are to be asked to offer them to growers at the special price. One manager had already agreed to sell 100 copies to members of his association. Others had agreed to use 50 and the opinion was expressed that there would be little difficulty in disposing of the entire 2,000 allotted. Interest has been displayed in Florida and in every citrus growing country in this scientific work.

THE FIRST LAND RUSH

"Lot," called his wife, "I'm going to look back."

"Well, you can if you wanta," replied Lot brusquely. "I'm going to keep right on to Florida."

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DAIRY ASSOCIATIONS ON THE JOB IN MARION

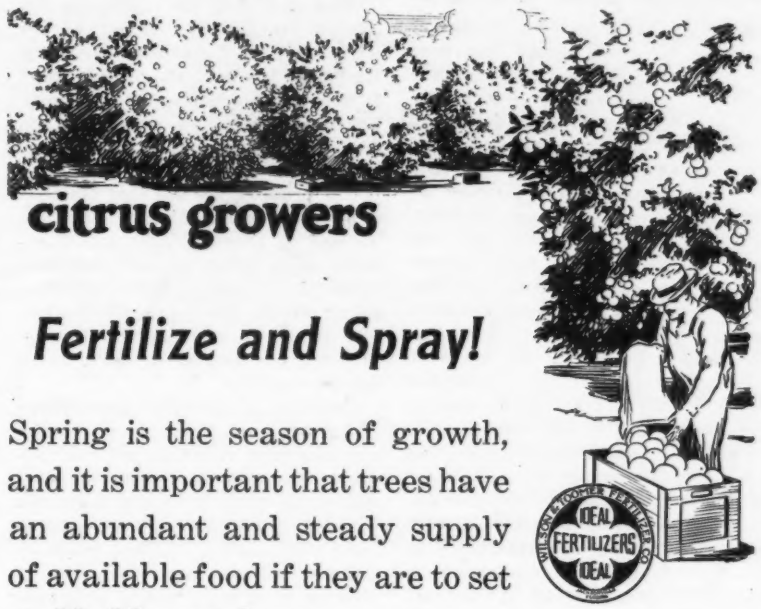
Ocala, Fla.—The South Marion Dairymen's Association at Pedro and the North Marion Dairymen's Association at Lowell are two recent farmers' organizations in the county which are firmly established and are promoting improved dairy practices in the county. The two associations recently purchased a carload of cottonseed meal and are encouraging the farmers of the county to grow their own roughage and grain feeds, and mix their own feeds.

The associations have also brought 12 good cows from Volusia County into Marion, and with the assistance of the county agent, C. R. Hiatt, have kept farmers from buying for dairy purposes any of a carload of scrub cows, partly beef breeds, which was shipped into the county.

These associations were organized in December of last year, with the assistance of Mr. Hiatt, and now have their own secretaries who handle the business of the two associations. The Pedro association has 15 members and the Lowell association 30 members.

BARK DISEASES TREATED IN DR. FAWCETT'S BULLETIN

"Bark Diseases of Citrus Trees in California" is the title of Bulletin 395 just issued by the University of California. It is prepared by Dr. H. S. Fawcett of the citrus experiment station, Riverside. This bulletin is in part a reprint of Bulletin 360 on "Gum Diseases of Citrus Trees in California," with revisions, additions and abridgments. Dr. Fawcett in his introduction states that its aim is to bring up to date and together "the information now at hand regarding the bark diseases, including the various major and minor forms of gumming in citrus trees under the conditions in California." Special emphasis is given to contributing conditions and to methods of prevention and treatment. Copies may be had by addressing College of Agriculture, University of California, Berkley.



citrus growers

Fertilize and Spray!

Spring is the season of growth, and it is important that trees have an abundant and steady supply of available food if they are to set and hold a good crop.

"Springtime practices in the Citrus Grove"–a new booklet by our Horticulturist, Prof. B. F. Floyd, tells how to fertilize and spray the grove at this season. A copy will be sent free on request.

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THE GROWERS' OWN PAGE

Continued from page 22

abide with us, yet we cannot agree among ourselves to do the right thing in the proper manner. How can we expect to get along with strangers?

There are some things that have been proven in the most positive manner. Co-operative associations cannot be successfully conducted without proper management, no matter what percentage of the crop is controlled. If the co-operative association is not working properly, first investigate thoroughly and then most positively insist upon prompt rectification of all things needing correction, even if it necessitates reorganization, getting rid of all the bad timber, no matter who or what it is, and demanding the best service possible. The industry needs what it has never had, a real live, competent leader and executive devoting his whole time to the work. He must be diplomatic, a firm disciplinarian, industrious, courteous, efficient, with thorough training and experience in the fundamental and practical business principles, showing by his past record that there is no doubt of his being fully equipped for the job. In other words a truly big man for a big job .With such a man at the head the growers will have confidence in the organization, causing many to come in who are now dissatisfied and holding back.

There is a certain prospect of a vast increase in the citrus production of Florida during the next five years. It is important that we should in the very near future make dependable preparation for the care of this certain increase as our present facilities are wholly inadequate for disposing satisfactorily of the crop we now have. The growers themselves must arouse and in conjunction with the best business men of the state take a hand in solving this problem which the present organizations cannot do as at present constituted.

Now I would like for you and your readers to comment freely on this article as I believe fully in giving growers, "the truth about Florida". If co-operative organizations are to establish themselves in the hearts of the growers the leaders must justify the trust placed in them by demonstrating to the members that the organizations exist and are controlled solely for the benefit of the producers and are managed by competent men. The large salaries paid many officials of co-operative organizations are justified on the grounds that these associations need the best brains available and must pay them. If the co-operative organizations are to beat outside competition they must employ men who know the game as well as any on the outside.

Why is it that the California Exchange controls 80 percent of the citrus crop in California, while our Exchange has so little of our crop? It is purely a question of confidence. To be successful we must build up an organization which commands confidence.

The probabilities are that the next crop will be unusually large and that we may go over the same sad experience as in 1924, as our marketing facilities are not sufficiently developed to provide profitable distribution. Let us lose no time in taking steps to place our marketing on a broad efficient basis.

One Florida periodical has cautioned against exaggeration, yet it comes out with most optimistic articles telling us the goose is hanging high for the citrus growers. When it quotes prices it should not confine itself to those obtained for the best grade as there are always large quantities of inferior fruit, particularly of grapefruit this year on account of large sizes which are unusually numerous. The prices we are getting are not particularly high, being caused by the crop shortage, so what we gain in price we lose in quantity. Further more it costs just as much to raise a small crop as a large crop.

This periodical which I mentioned, wrote me: "Of course our marketing system is demoralized, I agree with you quite fully in the points you bring out. You seem to have a clearer insight in our citrus trouble than most growers have. The more discussion we can create, the sooner we can clear up the issues." As this periodical agrees quite fully that things are in bad shape no doubt it will be very glad to help spread honestly and thoroughly "the truth about Florida," especially in regard to citrus.

Yours very truly.
Martin Lane.

Men are skeptical about God because they cannot see him. It is quite respectable to be so. But are they skeptical about the "alternating current" or a telephone message or an atom, because they cannot see it? They would not dare say so.—Philip Cabot.

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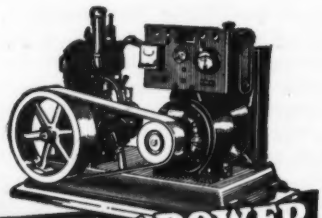

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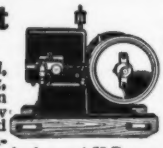

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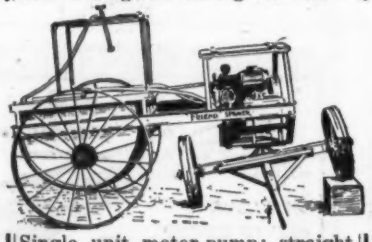

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Scale on Abnormal Trees

By J. G. Grossenbacher, Florida Insecticide Co.

It is a well known fact that when scale insects begin to become numerous enough in a grove to be noticeably injurious to trees that their effects are most evident on the roadside trees and on such other trees that for various reasons are making a subnormal growth. It had been generally assumed that road dust was a factor in protecting scale from their enemies on roadside trees; the same degree of injury on trees in the same grove of subnormal size and vigor was ignored in this assumed explanation.

In a recent discussion I called attention to the fact that roadside trees should be specially favored in the application of fertilizer and cultivation, also mentioning the fact that road dust was usually assumed to be a factor in the problem. It was pointed out that very likely wind and moisture is more pertinent than dust as an explanation of poor condition of trees.

The fact that an infestation of scale in such a grove becomes harmful first on roadside and other poorly conditioned trees does not require the assumption that scale multiplies more rapidly on such trees nor that dust protects them from their enemies. In reality interior trees in such a grove that are poorly conditioned get a similar injury by scale, therefore some other factor besides dust must be involved.

If we assume, for example, that all the trees of a grove in question have on them the same number of scale insects at a certain time and that the rate of increase in the number of scale insects is the same for all trees one may still be able to show that scale damage must be evident first on roadside and other poorly conditioned trees. For instance, the surface area of the bark and leaves of an undersized or slowly growing tree in a grove is often only half or even a tenth as great as that on a normal tree in the same grove and the rate of surface-area increase due to new growth of any season usually falls behind normal more and more as time goes on.

Now, if scale insects are assumed to increase at the same rate on undersized, poorly conditioned trees as they do on the thrifty ones, it becomes evident that the wide difference or discrepancy in the surface area or feeding space available for scale on the two types of trees forces the conclusion that the density of scale inhabitants per square inch of surface on normal trees is extremely small as compared to that on the undersized trees with similar feeding surface and much slower rate of surface increase due to new growth.

It seems to me that when the question is examined from this angle one can readily understand why roadside and other adversely environed trees in a grove are first and sometimes the only ones to show serious scale damage. It is much like a similar relation often noticed in regard to parasites on animals. In starting out with a uniform bunch of young animals, such as calves, pigs, or chickens after feeding them all alike for seveever months often a marked discrepancy shows up in the size, vigor and weight of members of the groups. A few of the calves in the bunch become scrawny, the difference may amount to as much as half the weight of the more thrifty majority. The same is true with the pigs and chickens. The runts soon show excessive numbers of parasites, such as ticks, lice and mites. If one assumes that the young animals in each group have approximately the same number of parasites to start with we may wonder why the pests become so much more numerous on the runts than on the thrifty ones. Evidently there are reasons for this. For instance, in case of ticks on cattle it may take longer for a brood to reach full size on an undernourished animal and consequently there would be an accumulation of abnormal numbers on an animal of that kind on account of the slowness of ticks to reach the shedding size. In regard to animals infected with lice or parasites that reproduce on the host the matter stands more nearly as it does with scale insects on trees. The rate of increase of the parasites being assumed the same on thrifty and undersized animals of similar age one cannot avoid the conclusion that the relative density of parasites per square inch of surface on runts and normal sized animals will soon be far different. The scrubs cannot avoid accumulating excessive numbers of such parasites in the course of time if for no other reason simply because of the much smaller feeding surface for the parasites.

To the general observer it usually seems that scrub stock just naturally accumulates more pests apparently because of the lowered vitality. There is doubtless some argument for such conclusions but I wanted to point out that the assumption of the lowered vitality factor is not as essential as it might appear. The same is true regarding the excessive accumulation of scale insects on ill conditioned trees in a citrus grove. We need not allow so much for the lowered vitality when it is made clear that even without such allowances there must of necessity be an excessive accumulation of scale on scrubby trees or on trees with an abnormally small increase in their feeding surfaces.

DISINFECTING TRUCK CROP SEED WITH CORROSIVE SUBLIMATE

By G. F. Weber

Truck crop seeds should be disinfected before they are planted to prevent seed-borne diseases from developing on the seedlings. The best disinfectant to use for this purpose is corrosive sublimate. This disinfectant can be purchased at your local drug store. It should be dissolved in water to make a solution to the strength of 1-1,000 and the seed should be soaked in this solution for varying periods of time depending upon the kind of seed. They should then be rinsed in clear water and spread out to dry. They are then ready to plant.

Corrosive sublimate is deadly poison and should be handled accordingly. It can be purchased either in the form of crystals or in tablet form. If a large quantity of seed is to be treated it would be well to purchase the poison in the crystal form. One ounce of crystals dissolved in 7 1-2 gallons of water will make a solution to the strength of 1-1,000. The corrosive sublimate crystals are easily dissolved in hot water. This will facilitate the process. If only small quantities of the disenfectant are desired it is best to purchase the poison in the form of tablets, then dissolve one tablet in one pint of water and the solution of 1-1,000 is obtained.

The disinfecting solution should be made up in crocks or wooden containers and never in metal containers. If mixed in metal the solution will be weakened by the disinfecting agent sticking to the metal.

Continued on page 34

Citrus scab

Relative Susceptibility of Some Rutaceous Plants to Attack by Citrus Scab Fungus

By John R. Winston, Associate Pathologist, and Johh J. Bowman and Walter J. Bach, Junior Pathologists, Fruit Disease Iyestigations, Bureau of Plant Industry

In a former publication by the senior writer of this paper were listed most of the commercially important citrus plants subject to scab in Florida. The present paper gives a more extensive list indicating the relative susceptibility to the disease as it occurs on its hosts in central and south Florida.

The data presented here are based on: (1) Observations made in commercial citrus nursery and grove plantings during more than seven years, viz, 1916 to 1924; (2) studies of rare forms undetermined susceptibility closely interplanted with sour orange seedlings severely affected with; and (3) inoculation tests made on many rutaceous plants growing on the grounds of the field station of the United States Bureau of Plant Industry at Orlando, Fla. The method used in these inoculation tests has already been described.

Citrus scab is caused by the fungus usually but erroneously referred to as Cladosporium citri pro tem Massee. Anna E. Jenkins, assistant mycologist in the Bureau of Plant Industry, United States Department of Agriculture, has published a paper dealing with the morphology and taxonomy of this organism and has described the scab pathogene as Sphaceloma fawcettii n. sp.

Observations and inoculations on commercial citrus varieties have been extensive enough to be thoroughly dependable; on the noncommercial varieties and hybrids they have been limited to a small number of plants, and for that reason the general impression of relative susceptibility is given tentatively. Further observations may indicate that these hosts may be affected in a degree different from that reported herein. Many of the rutaceous plants under study are quite small and have not fruited; therefore observations were limited to occurrence of the disease on leaves and tender twigs. However, for those forms that have fruited there seems to be no difference in susceptibility of the fruit as compared with leaves and twigs.

Relative Susceptibility to Scab

It is interesting to note that, with the exception of Claucena lansium, the rutaceous plants attacked by scab belong to the subtribe Citrinae. Members of only four genera, viz, Citropsis, Poncirus Fortunella and citrus known to be affected by this disease. Poncirus and Fortunella until a few years ago were regarded as members of the Citrus genus. Under conditions in central Florida, Claucena lansium is attacked moderately, while Poncirus trifoliata is only slightly affected. Only once has scab been observed on Citropsis and likewise only once has it been observed on any Fortunella species, in spite of the fact that for years they have been growing close to scab-infected grapefruit and sour orange trees. This kumquat (Fortunella) infection resulted from artificial inoculation.

At no time has scab been observed on four species of Citrus, viz, Citrus ichangensis, C. medica, C. janos, and C. webberi.

Several varieties of lemon (Citrus limonia) are extremely liable to attack by scab, while the sweet lemon and the dwarf Chinese lemon have thus far been observed to be distinctly less susceptible to severe injury.

The Kusaie and Sour Rangpur lime (C. aurantifolia) are severely attacked by scab. The Hall appears to be found affected with scab on several occasions; while the Persian, which is very similar to the Tahiti, the Mexican, the Thornless, and the Woglum lime, appear to be immune.

Most grapefruit (Citrus grandis) varieties are only moderately affected by scab. The Hall appears to be more susceptible than most varieties, while the Marsh seems less likely to be seriously attacked, but this difference is not sufficiently great to justify separate spray schedule for these two varieties. The apparently immune Royal and Triumph varieties are regarded as hybirds of orange and grapefruit. On the other hand, the Leonardi variety, which possesses a number of the distinctive growth features of the Royal and Triumph, and which is considered by some to be an orange and grapefruit hybrid, is about as susceptible as most commercial varieties of grapefruit. The pummelos are about as susceptible as most grapefruit. Scab has not been observed on the Cuban shaddock (considered by some to be a hybrid), a fact which increases its potential value as a rootstock for nursery use, because scab has a marked stunting effect upon very young trees of susceptible varieties.

The Sour and Bittersweet oranges (Citrus aurantium) are severely attacked by scab; the varieties Myrtle Leaf and Willow Leaf are moderately attacked, but the disease has not been observed on the Bergamot and Otaheite forms.

The common or sweet Florida orange of commerce (Citrus sinensis) is highly resistant to scab. This species is affected so rarely that for all practical purposes it may be considered immune. A trace of scab has been observed a very few times on each of these following varieties — Florida Seedling, Lue, Maltese, Mediterranean Sweet, Pineapple, and Washington Navel. The diagnoses in these cases were verified by cultures from the affected parts. A scab-like blemish of undetermined cause has been observed occassionally on the sweet orange, but microscopic and cultural studies have consistently failed to reveal the scab fungus in the affected tissue.

The kid-glove oranges (Citrus nobilis) on the average at least, are as likely to develop scab as the grapefruit. The King variety is very susceptible, the Satsuma is distinctly less severely attacked, while the Cleopatra mandarin appears to be immune. Because of its immunity to scab and because it develops an excellent root system, the Cleopatra mandarin is gaining popularity as a rootstock in Florida.

The calamondin (Citrus Mitis) is about as severely affected as the King.

The pointed-leaf form of Papeda (Citrus Hystrix) is also severely attacked by scab, while the round-leaf form has not developed this disease.

Thus it seems that in the several

groups susceptibile to scab infection there is at least one commercial member on which scab occurs, though Citrus sinensis and Fortunella margarita, for practical purposes, are immune.

Citrus Hybrids

Observations have been made on a rather large range of citrus hybrids and the degree of infection recorded for them is tentative and unless otherwise stated refers to leaf infections only. Many of these forms most likely will never be grown extensively, and only a few of them are now disrtibuted through the citrus belt of Florida. For these reasons the relative susceptibility to scab can not be determined accurately at this time nor possibly in the near future.

The data shows that when both parents of the hybrid are attacked by scab the progeny in general is more likely to be affected by that disease than when only one parent is attacked, and a hybrid resulting from the crossing of two scab-resistant forms is likely to inherit the scab resistance of its parents. With but few exceptions, citrus hybrids are at least as severely attacked as the most susceptible parent. The only hybrid under observation with a scab-susceptible parent that has thus far been scab free is the Faustrimedin, a plant that does not resemble the Calamondin in any of its gross characters. It seems from the data that liability to scab attack is transmitted from susceptible parents to the first-generation progeny.

Citrus Scab Outbreaks

Citrus scab is very erratic in its outbreaks. Tender growth is the most highly susceptible. The outbreaks vary not only from season to season, depending on weather conditions, but with individual trees. The variation with different trees seems to be due to the fact that under Florida conditions a citrus tree may start growth as much as two weeks or more before the surrounding ones and even on one side of a tree new growth may sometimes be a week or more slower in starting than on the other. This disease also varies from district to district. The grapefruit and lemon in the Rio Grande Valley are affected by scab much less than in Florida. In Alabama the Satsuma and the Trifoliata orange are much more severely attacked than the same varieties are in Florida. Peltier and Frederish report that in southern Alabama scab has not been observed on the Orangelo, Siamelo, or Siamor. The disease has been observed on these hosts in Florida. The Citrangequat seems to be more severely attacked in Alabama than in Florida.

The difference in degree of scab outbreak on a host in the several States seems more likely to be due to climatic conditions while the host is at a susceptible stage of growth rather than to fluctuating differences in inherent susceptibilities of the hosts or to altered virulence in strains of the pathogene.

Summary

The citrus scab fungus attacks a comparatively narrow range of plants in the family Rutaceae, as indicated by observations and inoculations made on 2 subfamlies, 2 tribes, 4 subtribes, 22 genera, 35 species, 71 varieties, and 47 hybrid combinations. Many citrus forms appear to be immune, while the susceptible ones exhibit all grades of resistance.

FLORIDA CITRUS FACES ADVERTISING COMPETITION NEVER BEFORE EXPERIENCED

Continued from page 5

Thirty-five percent of the fruit cannot carry the advertising burden of one hundred per cent, and it will take the revenue from all fruit to do the proper, effective advertising and merchandising job necessary if Florida is ever to successfully compete with California.

It seems strange that more Florida growers do not realize these facts. It is a condition which must be remedied; when will the owners of the 65 per cent of Florida's "free-riding" fruit wake up and help protect themselves?

Dangerous Over-Production Impossible

Prospects of a heavy crop seem to be throwing a scare through all State citrus circles. In view of the disaster of 1922 and 1923, I do not wonder at that. But the cry of "over-production" resorted to by many shippers is only too often a child-like alibi. The experience of those seasons should have taught a lesson.

There is no over production of citrus fruits, and any chance of it is indeed very distant. The per capita consumption of oranges, taken from figures recently released by the Federal Government, is only about sixty oranges per year—one a week; of grapefruit, just five a year. Would two, three or even ten times this volume be too much?

The unavoidable answer is NO—if the market and its consumers are prepared and developed to receive this volume at a price assuring a just return to the grower. Such can only be done by intelligent and adequate advertising and merchandising activities on Florida citrus fruits.

The only alternative, in the face of the certainly increasing production of all citrus producing sections, spells ruin. It cannot be considered.

WESTERN BEAN SEED WILL BE TESTED IN FLORIDA IN EFFORT TO AVOID DISEASE

Gainesville, Fla.—Through the efforts of M. R. Ensign, extension entomologist and pathologist, the Florida Agricultural Extension Service has received 460 pounds of bean seed from three Western states to be planted for testing in Alachua, Marion, Sumter, Palm Beach, St. Lucie, Putnam, Escambia, Okaloosa, Washington and Bay counties.

This seed comes from California, Idaho, and Colorado, where a good bit of work has been done to eliminate two very destructive bean diseases that are usually carried on the seed. These diseases are anthracnose and bacterial blight.

The lot received by the Extension Service contains seven different varieties, most of which are now commonly grown in Florida. This test seed will be planted alongside of seed of the same varieties received through the regular channels of trade in Florida, and the comparative amount of disease together with the relative productivity of the different seed will be noted.

It is hoped that this is but the first step toward getting disease-free bean seed for Florida from the arid Western states.

ORDER FERTILIZER EARLY IN CARLOAD LOTS; AVOID DELAY

Gainesville, Fla.—"Order fertilizer early," is the suggestion to farmesr and growers from Dr. R. W. Ruprecht, chemist of the Florida Agricultural Experiment Station, who says that congested railway conditions may cause serious delays in delivery of fertilizer, particularly in less-than-carload lots.

Dr. Ruprecht cites an example in which the Experiment Station had some fertilizer shipped from Tampa to Lake Alfred, a distance of 56 miles, and in which the fertilizer has been on the road over two weeks and hasn't yet reached its destination.

It appears that carload shipments come through in fairly good time, and Dr. Ruphecht urges farmers who do not need a full carload to join with their neighbors and place carload orders. This often enables them to save money as well as time.

Citrus Fruits, Packing

What Is Necessary to Prepare Citrus Fruits for Market

Radio Lecture by A. M. Pratt, of Chase & Company

Tonight we will consider "What is necessary to prepare Citrus Fruits for market". It is so simple that I'm sure we will grasp the problem at once by merely quoting the following conception of growing oranges and grapefruit:

"All you have to do in Florida is to plant some trees. Nature does the rest. You don't have to irrigate, as in California. You don't have to cultivate. The rain comes, the breezes blow—the sun shines, the oranges grow. 'Consider the lilies of the field they toil not neither do they spin, but Solomon in all his glory was not arrayed as one of these'. When the crop is ready, you pull your oranges and pocket your money."

Having been in the citrus business for over a quarter of a century, I am bold enough to swear as to the truth of this statement, and I'll swear it is not the truth. Any owner who thought it was true found he was growing scale on a large scale, while flies that make black oranges, and melanose that produced melancholy for him,—and mighty few oranges and grapefruit to sell. The Florida citrus business requires more spraying than praying, some cultivation of the soil and much cultivation of patience; pruning of deadwood from the trees, and illusions from the mind about easy money and little work. I imagine it is true of any farmer's job and, for all that, of any job in any worth while business that is contirbuting something to the good of society.

We have mentioned just a few of the problems that growers in Florida are so successfully overcoming in the growing end of the business. Let's jump into what happens after the crop is produced. First of all oranges are not pulled, or shaken from the tree. The stem of the oranges has to be clipped with special clippers so that the skin will not be bruised or torn, otherwise decay results. It costs 12 to 15c and sometimes 20c a box for the picking alone.

It is absurd to pay so much for such a delightful job. I know you would love to pick oranges. You have dreamed of it many a time—the healing caress of the breeze and leaves—the warm touch of the stimulating sunshine—the mocking birds and tanagers singing, and the incomparable fragrance of the orange blossom unknowingly but most certainly controlling your every motion,—where abandoment, courage, tenderness, life itself, seem crystalized into the supreme moment of happiness, the thrill of living with every sense alert;—and keenly yet dreamily satisfied.

Such is not a fact however, the job is a back breaker until the muscles are hardened. The sack holds from thirty-five to forty pounds and pulls hard on the shoulders as you twist and reach for every orange—with the cobwebs and dust covering your face and twigs falling down your back and bugs finding other places to further tickle your fancy. It's simply like any job—not what it's cracked up to be. That's why the colored man who does the picking, doesn't find much poetry in the lingering way at which he picks at his high rate of pay per box.

But let's climb down from the ladder and go along with our subject. The picker places each orange in his regulation picking sack thrown over his shoulder. The fruit is dumped carefully from the sack into the field boxes. These boxes are hauled to the packing house where everything is done to make the fruit look attractive, for the consumer. It goes through a regular manicuring process. The automatic dump carefully rolls the oranges into a large tank of water, they are carried by machinery between rapidly whirling brushes that clean off the dust, smut or other superficial blemishes, onto an endless belt of wooden rollers which roll the fruit over and over while high powered fans dry the moisture from the skin. This part of the job might be compared to the barber's electric vibrator rather than our manicurist.

This automatic washer and dryer then delivers the fruit on to a belt that passes in front of these men or girls who with practiced eye and hand sort the fruit, as to grade or looks. The brightest and best shape are placed on one belt, and are commercially known as Brights. The next brightest on another belt. They are Goldens. The darkest on a third and they are known as Russets, or Seconds. The grades correspond as you can see to Blondes, Demi-Blondes and Brunettes.

These oranges then pass on to the long automatic sizer. This sizing machinery with the large canvas bins arranged on either side permits only the smallest to drop first into the canvas bins, from which the girl packs 324 little oranges per box. This size the trade affectionately call marbles. The next set of bins permit an orange about 1-8th of an inch larger to drop from the automatic sizer and it takes 288 oranges to make the box—still pretty small. Then comes the 250—then 216, and this 216 is a good medium sized orange and in the respectable class. Each size is about an eighth of an inch larger in diameter than the next smaller size. As you walk along the bins you notice the 216 size is being packed in series of threes, the 200 size is a four-four pack and the 176 is a four-three. This 176 size orange is one of the finest sizes there is for eating qualities; yet being large enough to make it worth while to peel or slice, if one is as lazy as usual. The 150 size is a little over 3 inches in diameter. The 126 size is the one nearly every one picks as the showiest orange there is, when sending a box to a friend. The 176 or 150 are usually more tender and finer celled, but are too modest in looks to get the appreciation due. And to be frank, one of the finest eating oranges you can get is one of these marbles, a 288 or 324; but you don't eat them, you suck them.

As you watch the girl rapidly pick up the orange from the bin with the right hand while her left gets the tissue wrap into which the orange is thrown and twisted, you marvel at the packing speed so many attain.

Each box has its special pattern for packing that must be followed to make the box contain the exact count which is stamped on the box, and to permit the pack coming up symetrically and evenly. The automatic sizer and the tight packing by the girl, results in each box coming out with the top layer well rounded and considerably above the sides of the box.

When the packing is finished the girl pulls the box, which is on a bench with casters, over to the moving belt just to her left and this belt carries the box to the pressman who

with his special press rapidly pulls down the ends of the box, squeezes the oranges into the box more compactly and nails on his pine cover. This therefore in due form properly finishes the manicuring of the orange, where there was first the dipping in water, the lingering soaking, the brushing and handling, the careful drying, with light squeeze from the pressman and a final big squeeze from the car loader who has to load the boxes tightly in the car, to keep the boxes from rocking and the fruit becoming damaged in the usual banging around a car gets in switching before reaching destination.

These oranges or grapefruit are graded, sized and wrapped so as to permit shipping in each box a uniform amount of oranges of similar size and appearance and also to prevent waste by decay or waste of space, so that the trade and the consumer can get the greatest amount of oranges in each box for the amount of freight that has to be paid per box. The railroads take Florida oranges and grapefruit at an estimated weight of 80 lbs. to the box.

Each box shows the variety of orange, grade and size which is put on with a rubber stamp, just above the label on the end of the box which shows the special brand under which the fruit is packed. Each shipping organization has its special label by which they establish their reputation for proper grade, pack and keeping qualities. The wrap also shows the name of the packer and usually the brand or trade mark. So when you buy your oranges if you will notice the wrap, and if possible, the label end of the box, you can tell what brand you bought, the size and where it was shipped from. Some packers go farther and electrically mark each fruit with their trade mark on the skin of the orange so as to insure identifying the orange through to the consumer even if the wrap or label is not noticed. Every packer takes pride in his wrap and label as a means of identifying the merit of his article, and consumers could be more certain of buying fruit that suited their particular tastes if they more frequently noticed the wrap and label and called for the same brand again.

In loading a car, the boxes stand on end, label side up, to permit the buyer readily finding the different grades and sizes in the car and properly sorting it when he unloads the car into his warehouse.

These cars into which citrus fruits are loaded are refrigerator cars with ice tanks at each end, which permits keeping the fruit down to the proper temperature during warm weather. These same cars can also be used as ventilators during cool weather. If it is too cold, the railroads close their ventilators which are on top of the ice tanks, to prevent the fruit from freezing. Many cars from Florida start out with the ice tanks full of ice but with the ventilators open. This cools the fruit during the fore part of the journey, and then the ventilation, particularly while the car is travelling, keeps the fruit cool enough the balance of the journey, as the car travels into the cooler climate; or is closed by the railroads if it gets into weather much below freezing. This type of freight being perishable, the railroads give preferred attention so as to deliver the car to destination at greatest possible speed. The regular schedule for such perishables is 4 days from Jacksonville to New York.

All these cars are not sold before they start. In fact most of the cars are sold by telegram after being billed out to a temporary destination and rebilled or diverted to a destination further on before it reaches its first billing point, thereby permitting arriving without delay at the point where the car is sold subject to the purchasers' approval of the quality and condition.

After the car lot buyers gets his car, he sells it to his customers according to the special requirements of size and grade. Then these customers or retailers sell the fruit to you by the piece or dozen. About 45 per cent of the cars are sold at public auction mostly to the retailers with whom you deal as a consumer.

The grower usually gets his money for the car after the shipper has been paid by the car lot buyer. In other words he "gets his last". If the grower is in a pool he waits until the fruit in that pool period is sold. Part of the oranges and grapefruit are sold to buying shippers, who in turn sell to the car lot buyer. Most of the fruit is sold for the account of the grower either at an agreed upon definite charge, or at cost where the grower pays the expense connected with marketing.

So you have, I hope insight into the steps taken and the problems overcome in what is necessary to prepare citrus fruits for marketing to you as a consumer. There is many a hitch between the orange and your lip. The market on perishables is constantly fluctuating. The citrus grower is therefore necessarily one of the best gamblers that you can find. But he is doing everything possible to give you the benefit of his hard labor in the freshest possible condition and in the most attractive form possible.

And, folks, I haven't said a thing about the joys and heart aches, the criticisms, the suspicions and the soreness that results from a market that won't behave. A consumer pays usually a pretty even price for his oranges or grapefruit and hardly realizes that weather, apples, and all other fruits are affecting the daily market on oranges or grapefruit to such an extent that it may mean charges instead of profits to a grower, as a reward for his twelve months of labor in a clime—"where all you have to do is to plant some trees and Nature does the rest. The rain comes—the breeezs blow—the sun shines—the oranges grow—and the money comes in forever."

Good night.

SPRAYING FOR CITRUS MELANOSE CONTROL

Continued from page 7

ly considered as one part of a well directed campaign that will protect both fruit and trees from whatever threatens damage under the peculiar conditions obtaining. Whether or not spraying for melanose is needed or will prove profitable in a given grove depends on the probable development of a considerable amount on the fruit. Many groves, especially the younger bearing ones, do not require spraying for melanose. Still other groves vary much in their need for it from year to year, and good judgment, based on past experience and taking into consideration the probabilities for the current season, must be relied upon for the decision. There is still another group, comprising a large proportion of the old seedling groves in which proper spraying for melanose can be depended upon to yield a satisfactory profit every year. Melanose control is a big factor in the much-desired increase in proportion of high quality, bright Florida fruit.

Hunting and Fishing

is a monthly magazine crammed full of hunting, fishing, camping and trapping stories and pictures, valuable information about guns, revolvers, fishing tackle, game law changes, best places to get fish and game, etc. Biggest value ever offered in a sporting magazine. only $1.00 for THREE WHOLE YEARS, or send 25c in stamps or coin for six months trial.

HUNTING & FISHING MAGAZINE
303 Newbury St. Boston, Mass.

Derrisol, A New Aphid Spray

By John R. Winston, Pathologist, Peninsular Chemical Co.

Since growers have evidenced more interest in Derrisol than probably any new spray in many years, it may be of interest to them to know something of the history of this product, and its advantages, particularly the Derris extract which is the active ingredient in Derrisol. For many years scientists have been aware of the insecticidal possibilities of Derris extract, which comes from a plant grown in the Far East, in fact many and varied experiments were made on varied pests by scientists throughout the world.

Combined in some ways it made an excellent pulicide for destroying lice and fleas whereas in other combinations it was extremely efficient as an aphicide. The outcome of all of this investigational work over a period of years was the production of a proprietary product called Derrisol, which has enjoyed an excellent reputation and very wide use in several foreign countries, particularly in England for controlling the hop aphis which is often very bad necessitating almost perfect control to prevent ruination of this valuable crop. Some claim that Derrisol is probably more relied upon than any other aphicide for controlling the hop aphis in England, for it has advantages other than efficiency in controlling aphids.

Insecticides containing Derris have repeatedly been mentioned favorably in writings of European authorities as well as by a number of Entomologists in this country, but due to the distance and difficulty of securing raw materials Derrisol was purposely withheld from this market pending completion of plant equipment and location of materials to insure ample supplies to meet the demand. Such arrangements were completed sometime ago, and last year was devoted to introducing Derrisol to Experimental Stations and many large growers in this country for verification of results obtained in foreign countries. The results obtained from the various tests made in Florida and in other states by Experimental Stations and growers fully verified the reports obtained from other countries and stamp Derrisol as a worthy addition to the list of efficient insecticides recommended by State and Governmental Authorities. Fortunately results of these tests were known sufficiently early last year to enable Derrisol to be distributed in Florida so that growers could obtain it for this season's work.

Derrisol, the active ingredient of which is Derris extract, combined with other chemicals, is non-poisonous, virtually odorless, pleasant and safe to use and can be mixed with water, hard or soft, or with any of the other spray materials ordinarily used. Since Derrisol contains a spreader no soap is required when it is used with water other spray materials and it makes an excellent spreader for other spray materials. Derrisol should be diluted one part in 800 parts of water or spray solution, and besides being efficient in controlling aphids and thrips, it is cheaper than other efficient aphicides, and will not injure tender and delicate foliage, nor has it any disagreeable effect on the men applying it because it is non-poisonous.

Should a grower be spraying with lime and sulphur solution fer rust mites, oil emulsion for scale, Bordeaux Mixture for fungous diseases, or Arsenate of Lead for chewing insects, and any aphids are present, an addition of Derrisol 1 to 800 will pay handsomely enabling this pest to be controlled with the one spraying, or if aphids are present and no other application is to be made Derrisol mixed with water without soap will be the cheapest efficient liquid aphicide that can be applied.

The federal Warehouse Act which provides for the licensing and inspection of public warehouses by government officials, protects farmers from losses due to unsound or fraudulent warehouse receipts, says the United States Department of Agriculture. The law applies to warehouses for the storage of cotton, grain, wool, tobacco, farmers' stock of peanuts, late-crop potatoes, broomcorn, dry edible beans, dried fruit, and cane and maple sirup.

Cooperatives should be organized "for" a purpose, and not "agin" something.

Larger stocks of eggs and apples, and smaller stocks of butter, poultry and meat, are reported in cold storage by the U. S. Department of Agriculture.

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Quality Fertilizer for Quality Fruit

COLD STORAGE OF FLORIDA GRAPEFRUIT

Continued from page 9

somewhat higher price for this fruit than the usual market price at the height of the season. For a four to six weeks' storage period it is possible that curing the fruit before placing it in storage is unnecessary, as in most of our experiments the uncured lots did not begin to pit when stored at 32° F. until they had been in storage about six weeks, and in most cases the pitting was not sufficiently developed to make the appearance of the fruit objectionable from a commercial point of view until after two months' storage at this temperature.

Table 1. Effect of removing buttons on the rot of grapefruit in storage.

Lot	Number of fruits	Buttons in or out	Number of days at—		Percentage of—		
			32° F.	70° F.	Stem-end rot	Blue mold	Sound fruit
No. 1	66	In		15	6.1	3.0	90.9
				33	24.2	3.0	72.8
				43	28.8	3.0	68.2
No. 2	84	Out		15	4.8	4.8	90.4
				33	14.3	4.8	80.9
				43	17.9	6.0	76.1
No. 3	43	In	30	11	34.9	0	65.1
			30	19	62.8	0	37.2
No. 4	13	Out	30	11	11.6	0	88.4
			30	19	16.3	0	83.7

The evidence indicates that fruit to be stored more than six weeks should be cured before being placed in storage if pitting is to be avoided. Curing can be accomplished either by exposing the fruit to air at a temperature around 70° to 75° F. with a humidity of about 65 per cent from one to two weeks or by treating it with kerosene-stove gas in a coloring room for three or four days. The latter method is preferable, because during the curing porcess the buttons will be loosened, so that most of them can be removed during the process of washing and brushing the fruit. The removel of the buttons will tend to decrease the decay in storage.

Fruit for late storage should be picked in March or the early part of April and not left on the tree too long. If the fruit is seeded it should be placed in storage before the seeds begin to sprout. Fruit that remains on the tree too long is liable to break down in storage or soon after it is removed and placed on the market. It should not be stored too long, as considerable deterioration will result both in storage and after it is marketed. Uncured fruit should not be stored more than six weeks to two months, but cured fruit can safely remain in storage from two to three months without danger of much pitting. It is possible that some curing might result by shipping the fruit to storage in ventilated cars rather than under refrigeration. In the warm spring weather, however, considerable decay may develop in fruit so shipped, and the loss from this cause may exceed the cost of refrigeration. Undoubtedly from a commercial standpoint the storage of grapefruit is practicable.

There is a limited demand for this fruit in competition with cantaloupes, strawberries, peaches, and other similar fruits, so that care should be taken that the market be not oversupplied. The placing of too much of a commodity in storage, especially of a fruit which has a limited storage period, such as grapefruit, may result in attempts to market more than can be absorbed in the limited time the fruit can be held in good condition. With careful attention to marketing conditions, however, there seems to be no reason why the storage of grapefruit in limited quantities should not be profitable and safe.

It must be remembered that grapefruit grown in Florida was used in these experiments, and these recommendations for curing and storing apply only to fruit from that State.

CLUB WORK AND ITS JOYS

I love my sewing club because I love to sew.
And when camp time comes, I sure do love to go.
I love to sew and I love to make the things,
And when the club meets, everywhere joy rings.
I love to go in bathing and have such good old times
And to tell it all in letters, it would take about ten dimes.

—Estelle Ethrington,
Socrum Club Lakeland Fla.

A horse cannot pull while he is kicking, and cannot kick while he is pulling. Man might take a lesson from the horse.

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DISINFECTING TRUCK CROP SEED WITH CORROSIVE SUBLIMATE

Continued from page 27

The seed to be treated should be tied loosely in a thin cloth bag and submerged in the solution. Stir them occasionally with a stick to loosen all air bubbles that may be clinging to them. Soak them for the number of minutes as designated below. At the end of this time remove them from the disinfectant, rinse them in several changes of clear water, making sure that they are thoroly washed, then spread them out to dry in the shade. As soon as they are dry they are ready to plant. It is best to use a fresh solution with each batch of seed.

In measuring the amount of solution to treat a required amount of seed it is well to make up about three times the volume of disinfectant compared with the volume of seed to be treated.

After the disinfectant is used it should be disposed of carefully because it is deadly poison and will kill anything that drinks it. It is also well to take particular pains in caring for the treated seed because there is also some danger of these being fatal should they be eaten.

When the seed are spread out to dry one should be careful not to place them where there is danger of re-infection by common diseases that may cause damage in the field. Newspapers are very convenient to spread the seeds on.

Be very careful to soak the seed as per schedule below with special emphasis upon the time.

Below are some of the principal truck crops, seeds of which may be treated in corrosive sublimate to the strength of 1-1,000 for the number of minutes designated.

Cabbage, cauliflower, kahl-rabi, mustard, rutabagas and turnips 15 minutes.

Cantaloupes, cucumbers, gourds and watermelons 10 minutes.

Tomato, pepper and eggplant 8 minutes.

SOIL AROUND ROOTS OF PLANTS BARRED FROM PORTO RICO AND HAWAII

Plant quarantine measures to control the spread of certain injurious insects through the agency of sand, soil, or earth around the roots of plants from Porto Rico and Hawaii will become effective March 1, 1926, after which date it will be unlawful to ship plants from these Territories unless they have been entirely freed from sand, (other than clean ocean sand) soil, or earth into any other State or Territory of the United States, it is announced to-day by the Secretary of Agriculture.

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The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we connot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

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FOR SALE CHEAP—Eleven acres high, rooly citrus land; 4 acres cleared with small house, and large nice bearing orange trees full of fruit. Nicely located near Altamonte Springs, Fla. For particulars write H. A. Lunquire, 41 N. W. 29th St., Miami, Fla.

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Offer to the grower young trees of standard variety, backed by 30 years of nursery experience and a guarantee which only honest dealing can justify. For full information address A. H. Sloan, Box 413, Bartow, Fla

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Wanted AT ONCE few dozen fresh bittersour Marmalade Oranges. Price C. O. D.? M. L. Manning, 15 West Chase St. Baltimore, Md.

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MILLION Porto Rico Potato Plants, $2.50-1000. W. W. WILLIAMS, QUITMAN, GA.

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